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1990-1995



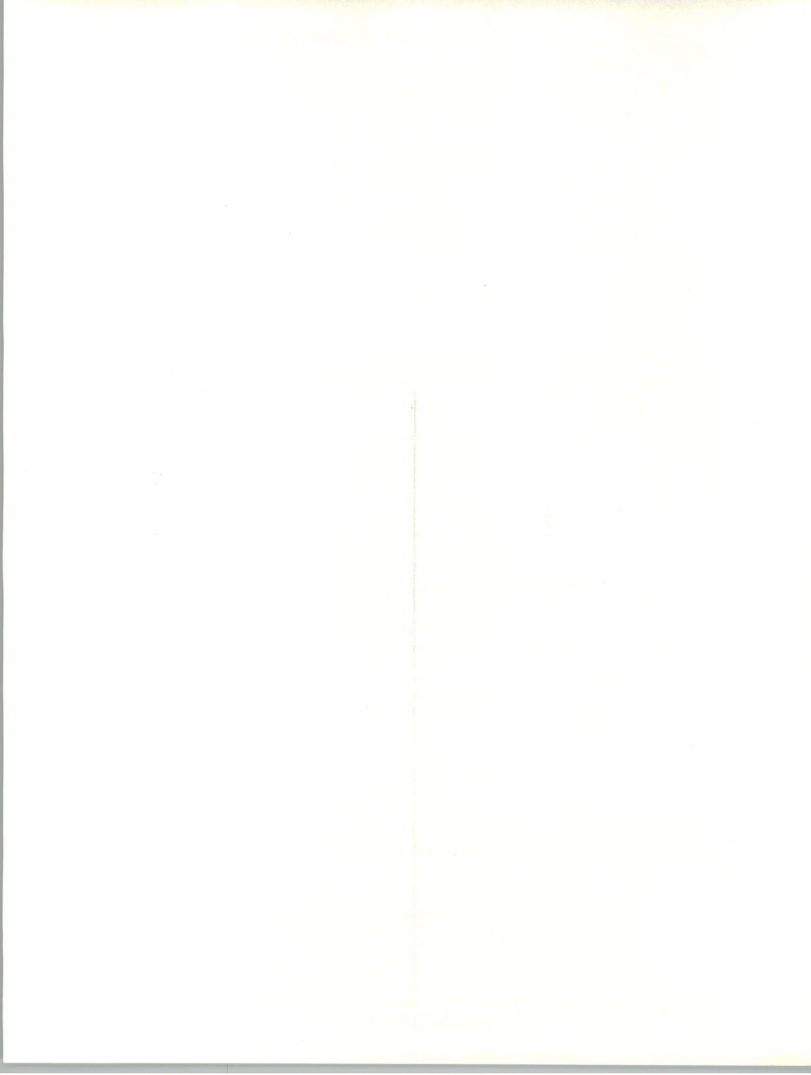
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Customer Service Program (CSP)

***Independent Maintenance Opportunities,
1990-1995***

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Abstract

This report provides an analysis of the independent maintenance market in the U.S and Western Europe. The report identifies the factors that have contributed to the success of independent maintenance, presents the views of the users and independent vendors, and identifies the factors that will influence the future development of the independent maintenance market.

Brief profiles on 30 U.S. independent maintenance vendors and 67 Western European vendors are also provided in the report.

This report contains 187 pages, including 44 exhibits and twelve appendixes.



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I

Introduction





Introduction

This report has been produced by INPUT as part of the 1990 Customer Service Program—International.

A

Objectives

The primary objectives are to analyze the market and identify opportunities for independent maintenance, and to identify the factors that have contributed to the success of independent maintenance and will influence its likely future development in the U.S. and Western Europe.

Additional objectives are to:

- Analyze data related to the business activities, marketing approach, and future plans of independent maintenance companies
- Provide individual company profiles of independent maintenance vendors

B

Scope and Definition

This report assesses the entire market for independent maintenance in the U.S. and Western Europe. INPUT defines independent maintenance as all maintenance of computer and data communications equipment not provided by the manufacturer of that equipment. In detail, this market can be divided into three subsectors:

- Maintenance conducted by completely independent vendors that are solely or partly dedicated to the provision of this service. Previously, these vendors were referred to as third-party maintenance vendors (TPM vendors), a term that INPUT now considers obsolete. Therefore, the terms used now are *independent maintenance vendor* or *independent vendor*.



- Maintenance conducted by an organization (typically a dealer or value-added reseller) that is responsible for the sale of the equipment but is not the manufacturer.
- Independent maintenance by equipment vendors, which is maintenance provided by an equipment vendor that does not supply or badge-engineer the maintained equipment. Normally this type of service is termed multivendor maintenance.

The growth and size of the customer services market will be found in the report *Customer Services Market Forecast, 1990-1995*.

C

Methodology

Field research for this report was conducted between March and May 1990, and consisted of face-to-face and telephone interviews.

Vendor information was obtained through the use of a formal questionnaire; in-depth telephone interviews were conducted with 27 independent vendors in the U.S. and 30 leading independent vendors in Western Europe. Where appropriate, data relating to the large pan-European companies was collected at the headquarters and country organization levels.

Information relating to additional vendors was collected by requesting these companies to update existing profile information. In total, information was collected from 30 independent vendors in the U.S. and 66 independent vendors in Western Europe.

Data relating to the views and perceptions of equipment vendors were obtained from discussions with these vendors. Such discussions are conducted on an ongoing basis by INPUT.

User information was collected during INPUT's annual computer user survey in 1990, during which computer users throughout the U.S. and Western Europe were questioned on a number of aspects related to the servicing of their computer systems. These interviews are conducted by telephone. In Western Europe the interviews were conducted in the respondent's mother tongue by a native of that country. Interviews were conducted with 35 users of independent vendor maintenance in the U.S. and 34 users of independent vendor maintenance, including five in-depth interviews, in Western Europe. Details related to the sample of independent maintenance users are listed in Exhibit I-1.

A copy of the independent vendor questionnaire is included in Appendix K, and a copy of the user questionnaire is included in Appendix L.



EXHIBIT I-1

**Independent Maintenance
User Sample**

Country	Number of Users
France	3
Italy	9
Netherlands	5
Norway	5
Sweden	3
United Kingdom	8
Germany	1
Total European	34
United States	35
Grand Total	69

D**Economic Statistics**

Exhibit I-2 provides a list of the U.S. dollar exchange rates and the inflation assumptions used in this report.

Conversion to U.S. dollars is used for comparative purposes.

E**Report Structure**

The remaining chapters of this report are organized as follows:

- Chapter II is an executive overview and provides a concise summary of the report.
- Chapter III provides an analysis of a number of areas related to the market environment in the U.S. and Western Europe.
- Chapter IV assesses the likely future development of the market, provides data relating to the future plans of independent vendors, and reveals the views of users related to this development.



EXHIBIT I-2

Economic Statistics

Country	Currency	U.S. Dollar Exchange Rate	Inflation (Percent)
Austria	AS	12.77	+3.0
Belgium	BF	38.06	+3.2
France	FF	6.17	+3.5
Italy	Lira	1,336	+5.8
Netherlands	DFI	2.05	+1.8
Spain	Pta	115.8	+6.6
Sweden	SK	6.39	+8.0
United Kingdom	£	0.63	+7.0
United States	\$	1.00	+4.1
Germany	DM	1.81	+3.3

Source: Exchange rates—IMF (average rates for fourth quarter 1989)
Inflation—Barclays Bank (1989)

- Chapter V provides analysis of the factors contributing to the success of independent maintenance.
- Appendixes A through J provide individual profiles of independent vendors in the different European countries.
- Appendix K contains the vendor questionnaire.
- Appendix L contains the user questionnaire.





Executive Overview







Executive Overview

A

Independent Maintenance Vendors Face Wider Service Challenge

Independent maintenance vendors will increasingly need to face the challenge of developing a wider range of system support services to maintain their growth momentum. Increasing sophistication and complexity of the overall computer system is creating new user demand for a range of operational support services, countering the market trends of lower hardware prices and reduced need for maintenance services. The challenge for the independent maintainers is to develop software and other operational support services to meet the widening range of user service requirements.

Independent maintenance of computer equipment in the U.S. and Western Europe is now a relatively well developed market. The principal developments over the last three years have been very high levels of mergers and acquisitions, and aggressive marketing by independent maintenance vendors. During this period a number of large U.S. and pan-European independence maintenance companies have emerged with the financial stability and the depth of expertise to provide a credible alternative to the maintenance services traditionally provided by the equipment vendors. Through dedication to the provision of computer maintenance, lower overheads than the equipment vendors, and an aggressive market approach, independent maintenance companies have been positioned to compete favorably on price and take advantage of user needs to reduce the cost of maintaining computer systems. The strength of independent maintenance has resulted in the equipment vendors' losing market share at a time when the growth of the customer services market has slowed appreciably.

The equipment vendors have reacted to the success of independent maintenance companies by introducing multivendor/single-source service offerings, but these offerings will have a limited effect on suppressing the growth of the independent vendor. Although users claim that one of the



predominant reasons for changing to independent maintenance is lower costs, there are also other reasons, such as the provision of true multivendor maintenance, flexibility of service offerings, and the responsiveness of independent vendors to user needs. The result is that even where equipment vendors are able to compete on price, some of the reasons for users changing to independent maintenance remain, indicating that opportunities for equipment vendors to regain lost business are limited.

One major weakness of independent maintenance companies is their inability to provide credible software support, an aspect of service seen by users as a major strength of equipment vendors. It is this lack of software support that will likely prove to be the Achilles heel of independent maintenance companies. As new technology continues to reduce the need for computer maintenance, the attractiveness of independent maintenance will decline and users will become open to integrated service solutions comprising equipment maintenance, software support, and a range of associated professional services. This change—which is going on now in the U.S. and, INPUT predicts, will occur during the latter half of the 1990s in Western Europe—will be responsible for a rapid decline in revenues for independent maintenance companies that have failed to foresee market changes and are unable to adapt. To survive the change, independent maintenance companies need to plan and implement changes that will transform the companies from independent maintenance to independent service companies.

Exhibit II-1 highlights INPUT's view of the key factors that will influence independent maintenance, primarily in the period 1990 to 1995, and also identifies a major long-term need for independent maintenance companies.

EXHIBIT II-1

Independent Maintenance in the 1990s

- Key cross-U.S. and pan-European companies established
- Major acquisition activity declining in Western Europe
- Long-term need for adaptation



The last three years have seen the development of a number of large independent maintenance companies, most of which operate at the U.S. and pan-European level. With a very active acquisition and growth plan, Bell Atlantic Business Systems Services (formerly Sorbus) has developed in the U.S. as a cross-continental provider of a wide range of maintenance services. Through a clear policy of acquiring market leaders, Granada Computer Services has emerged in Western Europe as a clear market leader with operations in nine European countries. Thomainfor, through similar acquisition activity, has become the second largest independent maintenance company in Europe with operations extending to seven European countries.

In the U.S., there will continue to be mergers and acquisitions as independent vendors continue to develop their capabilities and increase market share. One of the most popular methods of developing new capabilities has been to acquire or merge with a company that has developed that capability and is also looking to expand.

To survive the decline in equipment maintenance, independent companies will need to change from being providers of independent maintenance to becoming providers of a full range of independent support services.

B

The Independent Maintenance Market

1. Market Drivers

Exhibit II-2 lists the primary factors responsible for driving the growth of the independent maintenance market.

EXHIBIT II-2

Independent Maintenance Market Drivers

- User need for cost reduction
- Provision of local service
- Quality and flexibility



Users' need for cost reduction is one of the primary factors driving growth of the independent maintenance market. Independent maintenance companies with lower overheads than the equipment vendors are positioned to take advantage of this need and, aided by an aggressive marketing approach, have been able to achieve success in this task. Activities to reduce computer maintenance costs are stimulated by the decreasing costs and increased reliability of equipment and also by pressure on computer operations departments to reduce overhead and cost of computer ownership.

The ability of independent vendors to provide local service is often attractive to users, particularly in areas far from main business centers. Users claimed that by providing local service centers, the independent vendors are more responsive to fault calls and hence offer a higher level of service. Also, by being more "local," service from independent vendors is perceived by users to be on a more friendly basis.

Therefore, in simple terms, the primary factor driving independent maintenance is that independent vendors are perceived as providing what the user needs.

2. Market Inhibitors

Factors inhibiting the growth of independent maintenance are listed in Exhibit II-3.

EXHIBIT II-3

Independent Maintenance Market Inhibitors

- Limited price sensitivity
- Independent's software support credibility
- Fear of equipment vendor reaction

Users claim the primary success of independent maintenance companies is the ability to provide maintenance at lower cost than the equipment maintenance vendors. However, INPUT estimates indicate that overall in the U.S. and in Western Europe, less than one-half of users fall within the price-sensitive category, although this proportion of users is increasing. Even though the activities of the independent vendors are not



necessarily restricted to this sector of the market, the percentage of users that are price sensitive may prove a restriction on market growth.

One of the key factors limiting the growth of independent maintenance is the independent vendors' lack of software support capability. Though the users of independent maintenance feel that the independent vendor could support software, there is a major issue of credibility, to the extent that a minority of users feel that only the equipment vendor can provide effective software support. An allied issue is the increase in "predictive maintenance," whereby device-resident software can automatically notify the hardware vendor of incipient failure.

Users fear that, if they contract equipment maintenance to an independent vendor, the equipment vendor may react in some way that will preclude the effective provision of service to other parts of the system. For example, there have been instances where users contracting equipment maintenance to independent vendors have experienced increased prices for software support. Other examples include situations where users fear that equipment vendor responsiveness may be reduced.

C

Independent Maintenance Market Environment

1. Primary Source of Competition

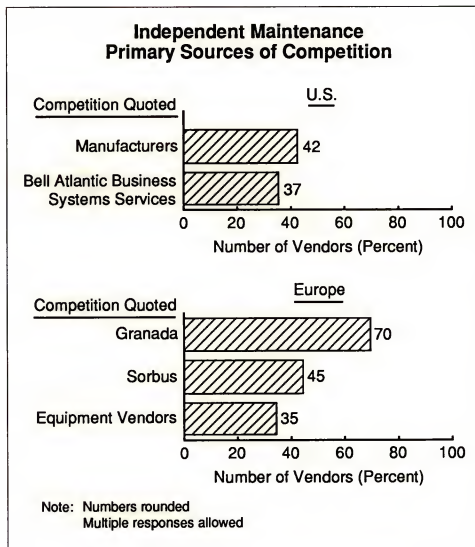
The primary sources of competition in the independent maintenance market in Western Europe are illustrated in Exhibit II-4.

In the U.S., the manufacturers were mentioned most often as the primary competition for the independent maintenance vendors. Bell Atlantic Business Systems Services received the second highest amount of mentions, because of its capability of providing service across the U.S.

In Europe, the equipment vendors are quoted as the third most prominent source of competition. This position indicates that the equipment vendors are intent on a policy of introducing service offerings that are intended to match those of the independent vendors. In a situation where equipment maintenance revenues, the primary source of income for the equipment vendors' customer services organization, are stagnating in terms of growth, the equipment vendors have been forced to react to the success of independent vendors.



EXHIBIT II-4



2. Equipment Vendor Business Recovery Opportunities

The key opportunities available to equipment vendors to regain business lost to independent maintenance companies are listed in Exhibit II-5. INPUT believes these opportunities offer limited scope for recovery.

The time of equipment replacement represents one key opportunity for equipment vendors. When new equipment is installed, it is normally covered by the vendor's warranty. During the warranty period the equipment vendor has opportunity to demonstrate service capability and obtain a service contract following expiration of the warranty period. However, the follow-on contract is not an automatic right and the equipment vendor will likely need to demonstrate a competitive service offering.



EXHIBIT II-5

**Equipment Vendor
Business Recovery Opportunities**

- Equipment replacement time
- Match independent's pricing
- True multivendor service
- Responsiveness

Once a user has opted for independent maintenance on grounds related predominantly to cost savings, this presents a very difficult situation for the equipment vendor, especially taking into account the higher overheads that equipment vendors have. The independent vendor will invariably have obtained the business by offering lower prices; therefore, to recover the business on price, the equipment vendor will likely need to offer a substantial discount that may be unacceptable in terms of profit margin.

Apart from cost, users have other reasons for changing to independent maintenance—for example, dissatisfaction with one or more aspects of the equipment vendor's services, such as inability to provide true multivendor offerings or responsiveness. Equipment vendor service is not sufficiently flexible in matching user needs and, even if the equipment vendor can match prices offered by independent vendors, the original reason for the user's opting for independent maintenance remains. Equipment vendors need to reevaluate their product orientations and become more responsive to the needs of individual users.

3. Market Hierarchy, 1989

Data relating to the five leading independent maintenance companies in 1989 are illustrated in Exhibit II-6 and also positions these companies in the market hierarchy.

In the U.S., Bell Atlantic retains its leadership position in the independent maintenance market, through organic growth and the acquisition of the third-party maintenance division of Control Data Corporation.

In Europe, Granada Computer Services retains overall market leadership and would appear to be unchallengeable as market leader. In 1989 Granada increased its market share to about 18% from 15% in 1988. Total revenues of Granada increased by over 60% between 1988 and 1989.



EXHIBIT II-6

Independent Maintenance Market Hierarchy, 1989

U.S. Companies	1989 Vendor Revenue (\$ Millions)	European Companies	1989 Vendor Revenue (\$ Millions)
Bell Atlantic Business Systems Services	280	Granada	260
GECS	275	Thomainfor	70
Diebold	210	Sorbus	60
TRW	150	Getronics	45
Decision Data	145	Concept (MIS/Spectral)	40

Note: Numbers rounded

The order of the leading five European companies has changed over the last eighteen months, these changes relating to Thomainfor and Concept. Thomainfor has emerged as the second largest independent maintenance company in Western Europe, primarily as a consequence of acquiring the European independent maintenance business of Control Data in June 1989. This acquisition increased Thomainfor revenues by about \$35 million and extended operations, previously limited to the French market, to seven European countries. Since June 1989, Thomainfor has acquired a further eight companies. These have been smaller acquisitions and include the operations of Tekserv in Belgium and France.

A second new entrant to the European top-five ranking is Concept. Concept is a French company, primarily active in the banking and financial sector of the software and services market, that acquired two of the leading independent maintenance companies in France at the beginning of 1989. These two companies were Spectral and MIS, whose operations at present are restricted to the French market.

4. Independent Vendor Sales Profile

The essential characteristics of the sales profile of independent vendors are highlighted in Exhibit II-7.



EXHIBIT II-7

**Independent Vendor
Sales Profile**

- 6.5% of headcount in sales
- \$1.2 million revenue per sales head
- \$74 thousand revenue per employee

Much of the success of independent maintenance in the U.S. and Western Europe has resulted from an aggressive sales and marketing approach by the independent vendors. The independent vendors, companies who are in the main dependent on maintenance revenues, have been able to implement a sales and marketing activity dedicated to maintenance. This ability contrasts with the equipment vendors, whose selling of maintenance has tended to be a secondary activity for a sales staff primarily concerned with the sale of computer equipment.

5. Equipment Vendor Reaction to the Independents' Success

Exhibit II-8 lists the opinions of independent vendors regarding equipment vendor reaction to their success.

EXHIBIT II-8

**Equipment Vendor Reaction
to Independents' Success**

1. Competitive response
2. Cooperative partnerships
3. Restrictive practices

Of the three likely reactions listed, independent vendors' concern over the equipment vendors' competitive response was given the highest importance. The concerns of the independent vendors can be summarized as follows:



- Fears that equipment vendors are willing to compete aggressively on price by introducing pricing flexibility and discounting. Equipment vendor price discounts of up to 30% were claimed by independent vendors.
- The introduction of extended warranties to lock out competition from independent vendors and actions by equipment vendors to bundle service with the sale price of equipment.
- Introduction by equipment vendors of multivendor/single-source maintenance offerings that would compete with the independent vendors. However, the independent vendors believe that these services are being introduced as a result of competitive pressures rather than recognition of user need.

Independent vendors believe that there will be a trend of cooperative partnerships between equipment vendors and independent vendors. Independent vendors claim that the motivation behind this trend is the equipment vendor multivendor services and results from limited multivendor capability. Therefore, partnerships would be used to supplement the equipment vendor capability.

One anticipated reaction is that the equipment vendors may introduce restrictive practices to constrain the activities of independent vendors. Examples are restricting availability of spare parts and diagnostic software and access to equipment documentation.

D

The Successes and Challenges of Independent Maintenance

1. Why Users Chose Independent Maintenance

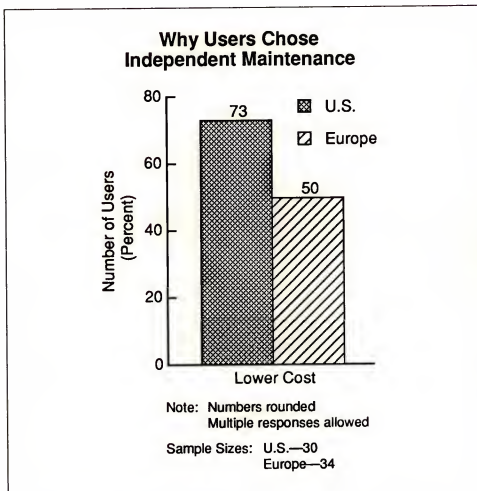
The reasons users chose independent maintenance are illustrated in Exhibit II-9.

Whereas cost was the primary reason that users in Western Europe contracted with independent maintenance companies in 1988, the prominence of cost as a reason has decreased in the last two years. Thus there are other reasons for the successful growth of independent maintenance, or equipment vendors have become more price competitive as a result of pressure from the success of independent maintenance. INPUT believes both reasons are important.

In the U.S., cost is still the number-one reason users choose independent maintenance. In the past, there has been some alternating between cost and quality of service, but it now appears that cost is the most important factor.



EXHIBIT II-9



2. Independent Vendor Strengths

Exhibit II-10 lists the strengths of independent vendors claimed by users in the U.S. and Western Europe. These strengths indicate why users decide to contract with independent maintenance companies.

In the U.S., price is still the most important strength because it supports the cost-containment efforts by users. The provision of quality/reliable service with the perceived technical advantage of the independent vendors' technical staff are seen as additional strengths. Responsiveness to user requirements, including single-source coverage, rounds out the users' list of the strengths of the independent vendor over manufacturer-provided service.

In Western Europe the responsiveness of independent vendors in developing a service package to meet the needs of users is often a reason why users opt for this type of service. Responsiveness in providing flexible and customized service packages to meet the needs of specific users,



EXHIBIT II-10

Independent Vendor Strengths	
U.S.	Europe
1. Price	1. Responsiveness
2. Quality/reliable service	2. Provision of multivendor service
3. Technical knowledge	3. Availability of independent and unbiased advice
4. Responsive to user needs	
5. Coverage—single service	

especially in areas where the equipment vendor is prepared to provide only a standard service offering, is appreciated by users.

Provision of true multivendor service is a second reason why users opt for independent maintenance. Users claim that equipment vendors do not offer true multivendor service. This is especially so in environments where the installed equipment is in some way unique, which often results in the equipment vendor's declining the opportunity to service the equipment.

The ability of independent vendors to provide independent and unbiased advice is valued by users, particularly advice on new installations or replacement equipment. In these situations, users felt that the equipment vendors were too heavily biased toward their own products.

3. Independent Vendor Weaknesses

Exhibit II-11 lists independent vendor weaknesses identified by users in the U.S. and Western Europe.

Weaknesses varied between the U.S. and Western Europe. In the U.S., the problem of spare parts availability remains. This has been perceived to be a problem for the last few years as users see that independents are not able to get replacement parts from manufacturers. Knowledge of advances in equipment technology is another independent vendor weakness that users perceive.



EXHIBIT II-11

Independent Vendor Weaknesses

U.S.	Europe
<ul style="list-style-type: none">• Spare parts• Knowledge of system advances	<ul style="list-style-type: none">• Software support credibility factor• Risk of overexposure• Larger companies run risk of losing user friendliness• Lack of intimate product knowledge

In Western Europe as in the U.S., users interviewed believed independent vendors could support systems software, but raised the issue of credibility. It appears that users would be prepared to contract software support to independent vendors, but only after demonstration of capability and the risk factors had been minimized. A minority of users believed software support can only be provided only by the equipment vendor.

Users in Western Europe feel that one weakness of the independent vendors was the risk of overexposure. This risk was a consequence of users' having the opinion that independent vendors are vulnerable to spreading resources too thinly over a wide range of equipment and geographies.

4. Independent Vendor Future Service Challenges

Illustrated in Exhibit II-12 are the key challenges that independent vendors believe are necessary to overcome in order to ensure continued long-term growth and success.

The major challenge raised by independent vendors was the need to develop a total service orientation. This challenge was assessed by vendors in three key areas:

- Vendors must extend the services offered to include a wider range of equipment vendors' products and the service of networks.
- Vendors must add new services to the existing portfolio.



EXHIBIT II-12

**Independent Vendor
Future Service Challenges**

1. Total service orientation
2. Cooperatives and partnerships
3. Market measurable service

- One area of vulnerability for independent vendors is the inability to provide a comprehensive range of supporting services for systems software. Vendors felt a solution to this problem was crucial. Eighty percent of vendors agreed that independents could support software.
- Independent vendors considered that cooperative agreements and partnerships would be a key trend as the market continues to develop partnerships with other independent vendors and with equipment vendors. The key challenge is not the forming of a partnership but the forming of a partnership that works to the benefit of all participants, including users.
- The third key challenge is the need to market measurable service. The mechanism of measurement needs to be structured very clearly in order to avoid disputes and disagreements while at the same time being practical.

E**The Future of
Independent
Maintenance****1. Independent Vendor Five-Year Strategies**

Vendor primary strategies for growth are summarized in Exhibit II-13. The strategies listed in this exhibit relate to the five-year strategies quoted by the leading independent vendors in the U.S. and Western Europe.

Strategies relating to activities indicate that:

- 14% of U.S. independent vendors and 40% of Western European vendors claim to be concentrating on a strategy of diversification into other services and other product areas rather than concentrating on equipment maintenance.



EXHIBIT II-13

**Independent Vendor
Five-Year Strategies**

- Diversification
- Acquisition growth
- Market specialisation

- A further 68% of the U.S. and 40% of the Western European independent vendors claim to be concentrating on a combined strategy of equipment maintenance and diversification.
- The remaining 18% in the U.S. and 20% in Western Europe claim that they will concentrate on equipment maintenance.

Growth strategies by independent vendors indicate that many will concentrate on growth by acquisition as well as organic growth.

2. Long-Term Service Trends

Exhibit II-14 presents INPUT's view of the trends in customer service from 1980 to 2000.

Before 1987, the emphasis of customer service activities was focused on the provision of equipment maintenance and systems software support. As the growth of customer service revenues started to slow, around 1987, equipment vendors began identifying alternate sources of revenue in an attempt to address declining growth. Areas where the equipment vendors identified potential sources of additional revenue can be generically grouped under the classification of professional services—for example, environmental services and consulting.

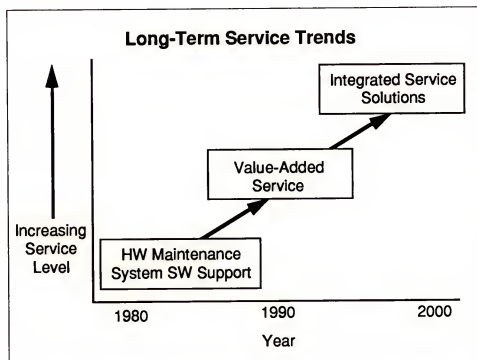
Vendors refer to these additional services as *value-added services*.

Independent vendors' activity has concentrated on equipment maintenance, with less emphasis being placed on added-value services. One of the reasons for this emphasis was the lack of software support capability, which has restricted the activities of the independent vendors.

INPUT believes that value-added services will evolve into the provision of integrated service solutions by the equipment vendors. This trend will be stimulated by a user requirement for total solution service.



EXHIBIT II-14



This trend toward total solution service raises two doubts over the future of independent maintenance companies:

- Their ability to develop software support capability
- Due to the criticality of software support as part of an integrated service solution, the ability to adapt to this change in market needs

3. Potential Crisis for Independent Vendors

The likely result of the trend toward integrated service solutions is highlighted in Exhibit II-15. In summary, the trend toward integrated service solutions heralds a potential crisis for independent maintenance companies in the beginning of the 1990s in the U.S. and in the latter half of the 1990s in Western Europe.

INPUT offers the following view of the likely results of this trend:

- Independent maintenance revenues will be subject to a rapid decline as equipment maintenance ceases to be an important element of service.
- The independent sector of the market will continue to exist and experience relatively high growth. However, long-term growth of the independent sector is a consequence of independent maintenance's evolving into independent vendors' providing a full range of independent support services.



- For independent maintenance companies to survive this evolution in service trends, they will need to become independent service companies.

EXHIBIT II-15

Potential Crisis for Independent Vendors

- Rapid decline in maintenance revenues
- Independent maintenance → independent service
- Adaptation key to survival







Independent Maintenance Market Opportunities







Independent Maintenance Market Opportunities

A

The Independent Maintenance Market

Exhibit III-1 lists the factors that, in INPUT's opinion, are influencing the independent maintenance market in the U.S. and Western Europe.

EXHIBIT III-1

Independent Maintenance Market Growth Factors

Drivers

- User needs for cost reduction
- User preference for single-source service
- Flexibility of independent vendors
- Attraction of responsive local service
- Aggressive marketing by independents
- User dissatisfaction with equipment vendor service/offerings

Inhibitors

- Equipment vendor competitive reaction
- Satisfaction with equipment vendor service
- User fear of equipment vendor reaction
- User contractual ties with equipment vendor
- Independent vendor lack of software support
- Limited price sensitivity





The primary factors driving the independent maintenance market are:

- User need for cost reduction
- The ability of independent vendors to provide a local service
- The flexible approach to service adopted by independent vendors and the quality of service provided

With continuing pressure being applied, by user senior management, to reduce the cost of running the companies' computer systems, the independent maintenance companies are well positioned to take advantage of this situation. Invariably the independent maintenance companies tend to have lower cost overheads than the equipment vendors and are consequently able to offer competitive prices. Competitive pricing, together with an aggressive marketing approach, has been instrumental in the success of the independent maintenance companies.

The ability and willingness of independent maintenance companies to provide a local service has been an attractive attribute of those vendors. Users located away from the main centers of industry and commerce claim that the availability of local service has enabled the independent vendors to improve on the responsiveness and response time performance of the equipment vendors. Local service also retains an image of being more user friendly.

Users claim that one major advantage of independent maintenance vendors is their flexible approach to providing service. The independent vendors are seen to be sufficiently flexible to provide a level of service that is heavily customized to meet the needs of individual users.

Although users claim the level of service provided by independent maintenance vendors matches or improves upon that provided by the equipment vendors, the provision of flexible and local service adds a further dimension and enhances the quality image.

INPUT research indicates that 80% of users prefer all maintenance on the computer site to be the responsibility of one service vendor. Additionally, almost 95% of these users would prefer this service to be provided by one of their equipment vendors. Although this aspect of user preference has yet to be fully taken advantage of by the equipment vendors, the independent vendors have been able to market this as a competitive advantage. However, this competitive advantage by the independent vendors has been lessened to a degree by the equipment vendors' implementing this type of service.



The three major factors inhibiting the growth of independent maintenance are:

- Limited user price sensitivity
- Lack of credible systems software support capability from independent vendors
- Fear among the user community of possible equipment vendor reaction

Users claim that the primary success of independent vendors is the ability to provide equipment maintenance at lower cost than the equipment vendors. Although INPUT research data indicate that the percentage of users that are price sensitive is increasing, user price sensitivity, or the lack of it, is considered by INPUT to provide a constraint on the growth of independent maintenance, even though the activities of the independent vendors are not necessarily restricted to this sector of the market.

One of the key factors limiting the growth of independent maintenance is the independent vendors' lack of systems software support capability. The users interviewed by INPUT did believe the independent vendors could provide a software support capability, but also believed there was a credibility issue. Credibility was a major issue and was highlighted by a minority of users who felt that only the equipment vendor could provide effective support of systems software.

One fear expressed by users is that, in the event of their contracting equipment maintenance to an independent vendor, the equipment vendor could react in some way that may prejudice the provision of service to other parts of the system. This fear relates to users who continue to use equipment vendor service and to a degree is a concern that software support prices could increase as a result of contracting equipment maintenance to independent vendors. Other examples include a user fear that equipment vendor responsiveness could be reduced.

Independent vendors commenting on the competitive reaction of the equipment vendors suggested that price discounting by the equipment vendors and their more competitive position of pricing was starting to take effect. Independent vendors claim to be feeling the pressure of equipment vendor competitive pricing.

B

Market Structure

Exhibits III-2 and III-3 provide a ranking of the leading independent maintenance companies in the U.S. and Western Europe.

In the U.S., Bell Atlantic retains its leadership position in the independent maintenance market through organic growth and through the acquisition of the third-party maintenance division of Control Data Corporation.



EXHIBIT III-2

**Leading U.S.
Independent Vendors in 1989**

Company	1989 Revenues (\$ Million)
BABSS	280
GECS	275
Diebold	210
TRW	150
Decision Data	145
IT	130
McDonnell Douglas (now Novadyne)	100
IDEA Servcom	70
NCR	100

Granada Computer Services retains overall market leadership and would appear to be unchallengeable as market leader. In 1989 Granada increased its market share to about 18% from 15% in 1988. Total revenues of Granada increased by over 60% between 1988 and 1989.

There are two new entrants to the leading five independent maintenance companies in 1989.

- Thomainfor of France has emerged as the second largest company in Western Europe. This is primarily a consequence of acquiring the European independent maintenance business of Control Data in June 1989, an acquisition that increased Thomainfor's independent maintenance revenue by about \$35 million. Prior to the acquisition, the activities of Thomainfor were limited to the French market; following the acquisition, Thomainfor operated in seven European countries. Since June 1989 a further eight companies have been acquired by



EXHIBIT III-3

Leading European Independent Vendors in 1989

Company	1988 Revenues (\$ Millions)	Independent Sector Market Share (Percent)
Granada	260	18.0
Thomainfor	69	5.0
Sorbus	60	4.0
Getronics	45	3.0
Concept (MIS/Spectral)	40	3.0
Econocom	37	2.5
Ibimaint	29	2.0
Servicetec	27	2.0
Metroservice	24	2.0
Computeraid	23	2.0
Extel	23	2.0
CGEE	23	2.0
Telub	23	2.0
ECS	16	1.0
ACT	13	1.0
Systems Reliability	13	1.0

Note: Numbers rounded

Independent Sector 1989 = \$1,435 million

Thomainfor, although these were less significant than the acquisition of Control Data's independent maintenance business.

- A second new entrant to the leading five companies is Concept, which acquired Spectral and MIS in France. Although Concept is primarily active in the banking and financial sector of the software and service

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text outlines various methods for collecting and organizing data, including the use of spreadsheets and specialized software. It also highlights the need for regular audits and reviews to ensure the integrity of the information.

2. The second part of the document focuses on the legal and regulatory requirements that govern the collection and use of personal data. It references relevant legislation, such as the General Data Protection Regulation (GDPR), and explains how these laws impact the way organizations handle sensitive information. The text provides guidance on obtaining consent from individuals, implementing data protection policies, and ensuring that data is stored securely. It also discusses the rights of individuals to access, correct, or delete their data.

3. The third part of the document explores the ethical considerations surrounding data collection and analysis. It discusses the potential for bias and discrimination in data-driven decision-making and the importance of ensuring that data is used responsibly. The text encourages organizations to be transparent about their data practices and to engage with stakeholders to address concerns. It also touches on the broader societal implications of data collection, such as privacy and surveillance.

4. The final part of the document provides a summary of the key points discussed and offers recommendations for best practices. It reiterates the importance of accuracy, legal compliance, and ethical conduct in all data-related activities. The text concludes by encouraging organizations to continuously monitor and improve their data management processes to stay up-to-date with evolving standards and regulations.

market, the company acquired two of the leading independent maintenance companies in France. For the present, the activities of these companies are limited to the French market.

Getronics, in mid-1989, commenced operations in Spain and is forecasting very high growth for this new company.

The leading five independent vendors account for almost 35% of user expenditure for independent maintenance in Western Europe, and the leading fifteen vendors for over 45%. The remaining market is distributed between over 400 companies.

C

Competitive Environment

1. Competitive Profiles

Exhibit III-4 illustrates the competitive position of vendors in the independent maintenance market overall for the U.S. and Western Europe. This exhibit provides data on the percentage of independent vendors claiming competition from various sources.

In the U.S., equipment manufacturers were quoted most often as being a source of competition for the independent maintenance vendors. Bell Atlantic Business Systems Services was the competitor quoted second most often, with mentions by 37% of the independent vendors. Other vendors mentioned as competition, each by 11% of their fellow vendors, were XL Datacomp, General Electric Computer Services (GECS), and regional/local independent maintainers.

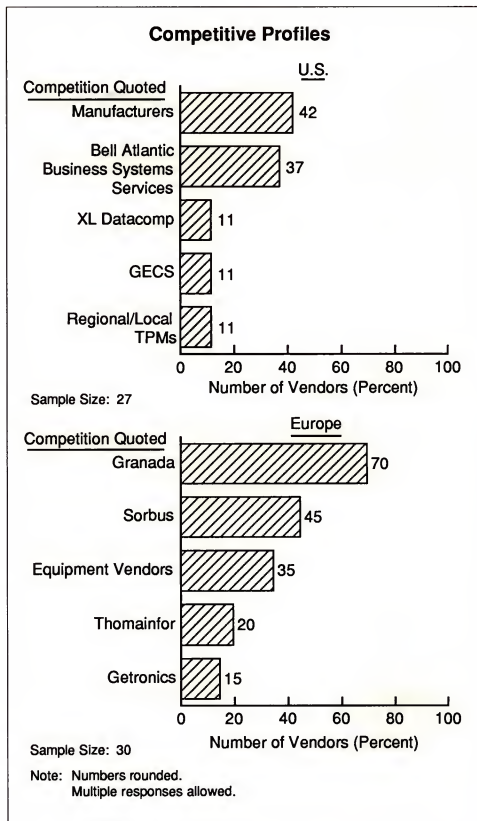
In Western Europe, Granada is the most frequently quoted source of competition because of Granada's dominant position in the market. Granada is almost four times larger than its nearest competitor, Thomainfor. Granada now employs almost 3,000 in independent maintenance operations, which cover nine European country markets. The company also retains a high-profile image aided by regular mentions in the trade press and a dedicated sales force of almost 120.

The third most frequently quoted source of competition is equipment vendors. This position in the competition league table is indicative of the competitive attitude the equipment vendors are taking and their multivendor service offerings. The level of competitive presence achieved by the equipment vendors indicates their serious intent to recover and restrain the growth of independent vendors. INPUT estimates that 90% of equipment vendors have, or are planning, multivendor service.

The reason why Thomainfor, the second largest independent vendor in Europe, is quoted as a source of competition by only about 20% of vendors most likely relates to the late entry of the company into the league table of leading independent maintenance companies.



EXHIBIT III-4





As the market continues to develop over the next five years, the intensity of competition is likely to increase as companies fight to retain and increase market share.

2. Equipment Vendor Reaction

The views of independent vendors on the likely reaction of equipment vendors to the success of independent maintenance are listed in Exhibit III-5.

EXHIBIT III-5

Vendor Reaction to Independents' Success

Reaction
<ul style="list-style-type: none">• Competitive response<ul style="list-style-type: none">- Pricing flexibility- Price discounting- Warranties- Bundling- Special contracts• Service initiatives<ul style="list-style-type: none">- Single-source/multivendor- Integrated solutions- Software support• Cooperative partnerships• Restrictive practices<ul style="list-style-type: none">- Parts- Documentation- Diagnostic software



Independent vendors expressed the most concern over the likely competitive response from the equipment vendors. The independent vendors claim that the equipment vendors are now aggressively competing on price. Equipment vendors are adopting a flexible position on pricing and are discounting. Discounts of up to 30% by equipment vendors were claimed by independent vendors. The introduction of extended warranties and the bundling of service with the sale price of equipment was quoted by independent vendors.

Independent vendors claimed that the introduction of multivendor maintenance by equipment vendors was more an instrument of account protection than a response to user needs. Data suggest that as a result of equipment vendor multivendor service, the independents have lost a degree of competitive edge. Independent vendors are concerned that equipment vendors will use software support capability to leverage new service initiatives that, together with professional services, can be formulated to provide integrated service solutions. Many of the independent vendors have also reacted with software support offerings. These offerings may be initially very limited—to test the waters and give the vendor a chance to develop more-sophisticated software support services. The ability of the independent vendors to match these solution-oriented service offerings is doubtful in INPUT's opinion.

Independent vendors believe there will be a trend of cooperative partnerships with equipment vendors. One factor that could stimulate this trend is the need for equipment vendors to subcontract in order to provide full multivendor service. A second factor is the need for independent companies to gain access to systems software support capability, which is essentially the domain of the equipment vendors.

Some independent vendors are concerned that the equipment vendors will introduce restrictive practices to constrain their activities—for example, restricting the availability of documentation, spare parts, and diagnostics. However immoral or illegal this practice may be, issues of this type take time to resolve; the independent vendors believe the time provides the equipment vendors with a competitive advantage.

3. Acquisition and Change

Exhibits III-6 and III-7 list the major acquisitions and changes in the last year.

In total, 13 acquisitions in the U.S. and 26 acquisitions in Western Europe are listed in Exhibits III-6 and III-7, a figure that is slightly reduced from the previous year. Of more consequence is that the significance of the acquisitions was at a lower level, in that most involved the acquisition of small companies.



EXHIBIT III-6

1989/1990 U.S. Acquisition and Change Activity

Company	Activity	Notes
AMSCO Int. Inc.	TRW Medical Electronics Div.	AMSCO Eng. Service
Diebold Inc.	EDS Field Service Div. of Payment Services	Diebold
Halifax Eng. Inc.	DEL-NEC	Division of Halifax
	SIDEREAL (parts division)	
Bell Atlantic	Dynservice Network	Bell Atlantic Computer Technical Services (Dynservice Network Division)
Intellogic Trace Inc.	The William Marion Co.	
	Texcom	
Novadyne	McDonnell Douglas Field Service Co.	Management Leveraged Buyout
TRS	Premier Computer Corp.	FRS
General Disk Corp.	ASG (controlling interest)	
Bantec	Computer Entry System	
Bell Atlantic	Electronic Service Specialists Ltd.	name change: ESS Div.
Bell Atlantic Business Systems Services	Control Data Corp.	Bell Atlantic Business Systems Services



EXHIBIT III-7

1989/1990 Western European Acquisition and Change Activity

Company	Activity	Country
Thommainfor	Acquired: <ul style="list-style-type: none"> • SOPAA • Matra Data Systems • Control Data TPM business • APH • Tekserv • Tekserv • Datacom • GEMC • AWITEX 	France France Europe-wide Austria France Belgium Austria France Germany
Nixdorf	Acquired 51% of Sintec	Spain
K.H. Services	Now includes DTC	Netherlands
Getronics	<ul style="list-style-type: none"> • Commenced operations in Spain • Acquired XTEC • Acquired 34% of Interscan Computer Services 	Spain Netherlands Germany
Eltec	<ul style="list-style-type: none"> • Commenced operations in France and Portugal 	France Portugal
Apricot	<ul style="list-style-type: none"> • Acquired DDT • Acquired ITL Service business merged as ACT	U.K. U.K.



EXHIBIT III-7 (cont.)

1989/1990 Western European Acquisition and Change Activity

Company	Activity	Country
Systems Reliability	Acquired: • Southeast Computers • Orisis • GST Computers • Aquix • Minority share in Optim	U.K. U.K. U.K. U.K. U.K.
Metroservice	• Acquired Profinform	France
Granada	• Acquired Uniserv • Acquired David Computer Services	Germany Netherlands
Servicetec	• Acquired maintenance business of Ferranti Computers	U.K.
MBS	• Acquired Extel	U.K.
Ferrari	• Acquired Pericom	U.K.

There were, however, major acquisitions:

- Bell Atlantic Business Systems Services acquired the third-party maintenance division of Control Data Corporation.
- Management bought the McDonnell Douglas Field Service Company, now Novadyne.
- In June 1989 Thomainfor acquired the European independent maintenance business of Control Data.
- Apricot Computers acquired DDT and Information Technology (ITL) in the U.K. This acquisition included the field service organization of ITL.
- As a result of financial problems at Ferranti, the computer maintenance business of that company was acquired by the relatively unknown

Servicetec. The purchase by the much smaller Servicetec was made possible by access to and support of venture capital companies.

- The most recent acquisition is that of Extel by MBS in May 1990.

INPUT believes the level of significant acquisitions will decline as the available companies diminish. There will likely continue to be acquisitions of smaller companies, but the situation would now appear to have reached a position of relative stability as the leading companies have become established.





IV

The Future Development of Independent Maintenance



the 1990s, the number of people in the world who are under 15 years of age has increased by 1.2 billion, from 1.1 billion in 1980 to 2.3 billion in 1999 (United Nations 2000).

There is a growing awareness of the need to address the needs of children in the 21st century. The United Nations Convention on the Rights of the Child (1989) has been signed by 112 countries, and the United Nations Millennium Declaration (2000) has set out a commitment to 'ensure that all children, everywhere, have access to primary education' (United Nations 2000, p. 1).

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The Future Development of Independent Maintenance

A

Vendor Development 1. Vendor Strategies

During the course of interviews, independent vendors were questioned about the key five-year strategies of their companies. A consensus of vendor strategies is illustrated graphically by Exhibit IV-1.

About 82% of the U.S. independent maintenance vendors are concentrating on diversification, as opposed to 80% of the leading independent vendors in Western Europe. This diversification includes extending existing services, the addition of new services, and diversification into related areas, which include sales activities. The 82% of U.S. independent vendors implementing this strategy is split into 14% concentrating on diversification only, and 68% combining diversification with current equipment maintenance activities. In Western Europe, the 80% of vendors implementing this diversification strategy is equally divided into vendors combining diversification with their current equipment maintenance activities, and those concentrating on diversification.

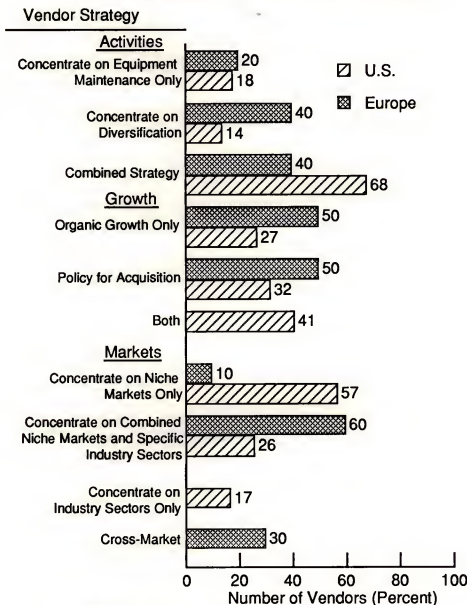
The remaining vendors (18% in the U.S. and 20% in Western Europe) claim to be concentrating solely on their existing equipment maintenance activities. INPUT contends that this is a narrow view that needs to change with changing market conditions. Otherwise, long-term company prospects may be seriously curtailed.

On the subject of strategies for growth, in Western Europe the independent vendors were equally divided into those with an intent to pursue a policy of growth by acquisition and those that claimed to be following a policy of organic growth only. Although acquisition opportunities continue to exist, the probability of major acquisitions appears unlikely—the majority of the major independent companies are now well established and have reached a position of relative stability. Future acquisition activities are likely to be at a much lower level than those of recent years.



EXHIBIT IV-1

Leading Independent Vendor Strategies



Sample Size: Europe = 30, U.S. = 23

Note: Numbers rounded

In the U.S., 73% of the independent vendors reported a planned growth through acquisition, with only 27% expecting to grow through an increase in business. There appears to be much more activity in the U.S. in the acquisitions and mergers of independent maintenance vendors. Bell Atlantic is one of the more aggressive companies that is growing through the acquisition of smaller maintenance companies.



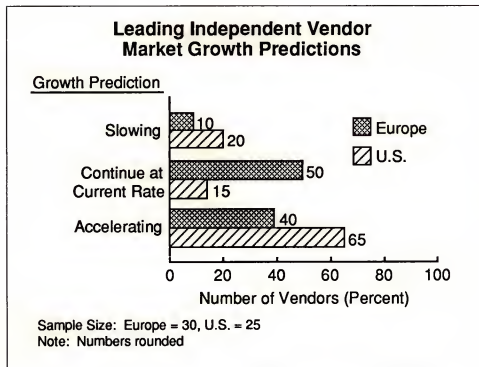
Strategies relating to market specialization indicate that a significant minority of U.S. independent companies, 40%, intends to concentrate on niche markets. An additional 26% plans a strategy of concentrating on niche markets and specific sector markets.

In Western Europe, the opposite strategy was reported, with 60% of the independent vendors concentrating on a combined policy of marketing in niche markets and specific industry sectors. Only 10% of vendors claim to be concentrating specifically on niche markets. Other data collected in Western Europe indicate that across the spectrum of leading independent vendors, there is little specialization in specific industry sectors. All sectors appear to provide similar revenue contributions.

2. Vendor Growth Predictions

Exhibit IV-2 provides illustration of the independent vendors' view of future growth of the independent sector of the market.

EXHIBIT IV-2



In overall terms, the independent vendors feel optimistic about the continued growth of the independent market sector. About 80% of vendors interviewed in the U.S. and 90% of vendors interviewed in Western Europe considered that market growth would continue at the current rate or accelerate. Only 10% of the vendors in Western Europe and 20% of independent vendors in the U.S. believed the growth rate would be slowing.



There appears to be more optimism in the U.S. market—65% of U.S. vendors expected growth to accelerate versus 40% in Western Europe.

3. Cooperative Partnerships

During the course of interviews with independent vendors, a significant majority of vendors suggested that cooperative partnerships would become a trend in the independent sector of the market. The types of partnership agreements mentioned by independent vendors ranged from those between independent companies to agreements between independent vendors and equipment vendors.

However, during discussion with independent vendors in Western Europe, INPUT discovered that a formal partnership agreement between a number of independent vendors has already been formalized. The key elements of the agreement are outlined in Exhibit IV-3. The partnership is named EUROSERV and was formed to provide pan-European service through a partnership that competes with the large pan-European companies without recourse to formal merger or acquisition.

EXHIBIT IV-3

EUROSERV—An Independent Cooperative Partnership

- Formal agreement between six independent vendors
- Provides pan-European service in six countries
- Seeking to extend agreement to cover additional countries

The companies involved in this partnership are:

- ATM (covering the U.K.)
- Telub (covering Scandinavia)
- Telub Bitronic (covering Germany)
- Spectral/MIS (covering France)
- SS&S (covering Austria)
- K.H. Services (covering the Benelux region)



The companies involved are currently searching for suitable partners in Spain and Italy, companies that are financially strong and have a reputation for delivering quality service.

B

Service Product Development

1. Diversification Plans

The degree of service coverage currently claimed by the independent vendors is relatively high with respect to the number of leading vendors that offer these services. Exhibits IV-4 and IV-5 illustrate the current services offered and the level of activity among independent vendors aimed at extending the range of services provided.

These services, which are claimed to be provided by more than 50% of the leading independent vendors in the U.S., are:

- System configuration
- Installation/deinstallation
- Equipment training
- Consulting
- Preventive maintenance

Ninety percent of the U.S. independent maintenance vendors reported providing preventive maintenance services to their clients. This supports the views of many independent maintenance vendors that system downtime can be reduced through preventive maintenance.

Although the provision of system planning and disaster recovery services was reported by less than 50% of the vendors interviewed, many are planning to add these services to their service coverage.

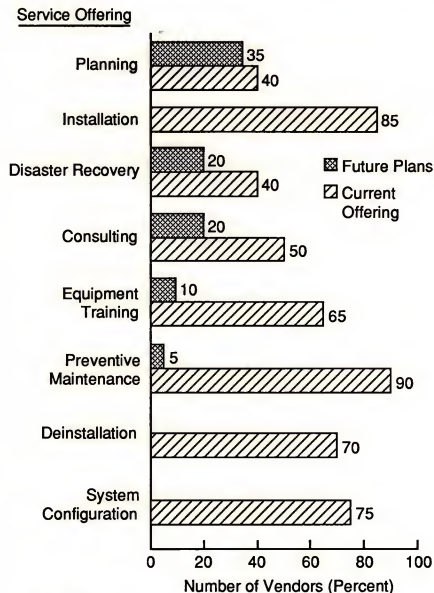
In Western Europe, the services claimed to be provided by more than 75% of the leading vendors are:

- Systems and maintenance planning
- Installation/deinstallation
- Equipment training
- System configuration

Services attracting the most interest from independent vendors as future service offerings in Western Europe include consulting; 30% of the leading independent vendors plan to provide this service. However, the service that is attracting the interest of the highest percentage of independent vendors as a future offering is disaster recovery services. Previous research by INPUT has indicated that, in Western Europe, this service sector is heavily dominated by the independent companies, not specifically independent maintenance companies. In 1988, INPUT estimated that independents had about 95% market share and, although there has



EXHIBIT IV-4

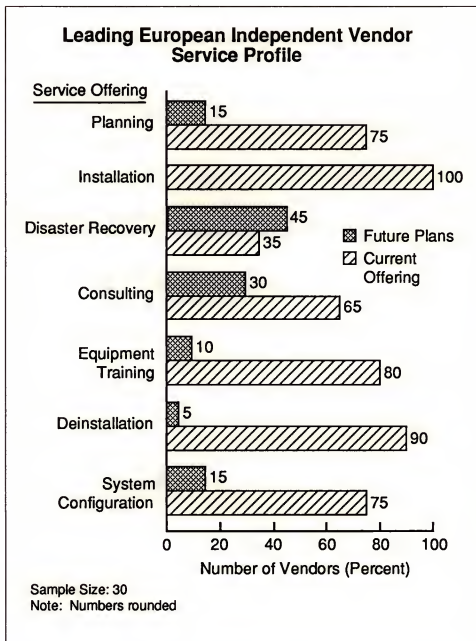
Leading U.S. Independent Vendor Service Profile

Sample Size: 27

Note: Numbers rounded



EXHIBIT IV-5



been some activity by the equipment vendors (specifically IBM, Unisys, NCR, and ICL), this activity has been too recent to significantly affect the independents' market share.

Exhibit IV-6 provides data related to diversification by the independent vendors into non-service-related activities. Although some vendors are planning diversification into these areas, the data indicate a higher percentage of U.S. vendors is diversifying into these areas than of Western European vendors. Approximately 60% of the U.S. vendors reported



EXHIBIT IV-6

Leading Independent Vendor Diversification

Diversification Activity	Number of Vendors (Percent)			
	Europe		U.S.	
	Current	Planned	Current	Planned
Equipment Sales	40	0	45	20
Application Software Sales	10	20	60	10
Computer Supplies Sales	45	10	40	5

Sample size: Europe = 30, U.S. = 27

being in the application software sales area, with another 10% planning to expand into the sales of application software. In Western Europe, it appears that diversification into non-service-related activities does not rate as high in future plans as in the U.S.

2. Future Directions

During the course of interviews, leading independent vendors were asked to indicate what changes the independent maintenance companies need to implement in the next five years to ensure the long-term viability of the company. Exhibit IV-7 lists a consensus of independent vendor opinions.

The most popular opinion expressed by the independent vendors was the need to develop a total service orientation. This orientation encompassed an extended range of services and the provision of new services but, more importantly, indicated a recognition of the need to develop a credible software support capability and awareness of the opportunities provided by network services. These opinions indicate that about 70% of the leading independent vendors have an awareness of the likely trend toward integrated service solutions.

The lists produced by the U.S. vendors were extremely close to those produced by the Western European vendors, suggesting that both groups share many of the same views on how to survive in the independent maintenance market. The U.S. vendors added differentiation of services as an issue for the future.



EXHIBIT IV-7

**Independent Vendor
Need for Future Direction**

Reaction
<ul style="list-style-type: none">• Total service orientation<ul style="list-style-type: none">- Extend range- New services- Software support- Network services- Differentiation of services• Cooperatives and partnerships<ul style="list-style-type: none">- With equipment vendors- Other independents• Market measureable service<ul style="list-style-type: none">- Quality- Restore time- System uptime

Independent vendors expressed a need for more cooperation between companies. Cooperation included partnership agreements with other independent vendors and the equipment vendors. Cooperative agreements between independent vendors have already commenced in Western Europe, for example the EUROSERV agreement. There is some evidence relating to the existence of agreements between independents and the equipment vendors. INPUT estimates that the leading independent vendors in Western Europe obtain almost 10% of revenues from activities carried out on behalf of equipment vendors.

About 20% of the leading independent vendors said there was a need to market measurable service. The concept involved implementing a mechanism by which the quality of service, system restore time, and system uptime could be accurately measured and used to demonstrate the value of service to the user. This type of approach to service needs to be



carefully documented to avoid disputes and disagreements. However, as a marketing tool the approach could be quite powerful, the contracted price being decided by mutually agreed performance. If performance is not achieved, the user obtains a discount; in the event that performance is exceeded, it may well be that some users would be prepared to pay a premium.

Some independent vendors mentioned that independent companies need to implement a more structured and mature approach to their businesses. About 15% of vendors believe independent companies need to review their business operations to concentrate on profit rather than revenue. These two quantities have always been mutually exclusive. Also, companies need to develop critical mass in order that the benefits of profit and size can provide the necessary funds for investment in the servicing of new-technology products and new service offerings. In brief, these vendors were suggesting that the independent maintenance market has now developed and the next phase is for the independent companies to mature.

C

Software Support from the Independent Vendor

1. Independent Software Support Status

Data contained in Exhibit IV-8 provide an indication of the current status of the software support capability of the independent vendors in the U.S. and Western Europe. The data in this exhibit are based on an assessment of answers to questions related to current services offered and those the independent vendors plan to offer in the future.

The data indicate that a significant proportion (80% in Western Europe and 70% in the U.S.) of independent vendors currently provide systems software support or plan to introduce it as a future service. Although the vendors claiming to provide a systems software support capability tend toward the smaller systems/PC sector, this is not a general characteristic. It is, however, a trend that independent companies that are subsidiaries, with software support available from the parent group, tend to concentrate on equipment maintenance.

A slightly lower proportion of independent vendors in Western Europe claim the capability to support applications software; vendors' approach to this area of support suggests a degree of uncertainty. Nonetheless, over 50% of vendors in Western Europe claim to currently provide or plan to introduce applications support. The type of applications support provided by independent vendors is, by the nature of the market, heavily biased toward universal or standardized applications—for example, PC and networking applications. Independent vendors' support also tends toward providing an advisory service rather than "hands-on."

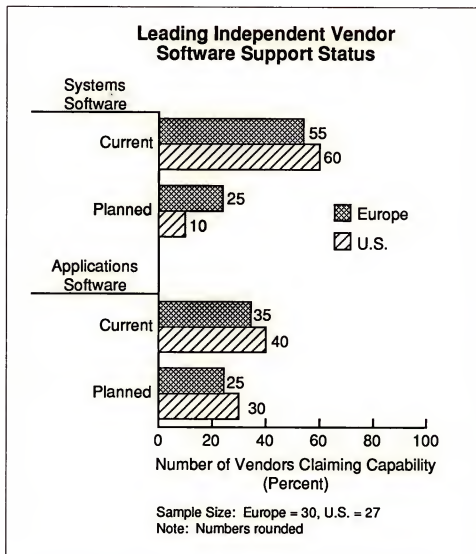
1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text outlines various methods for organizing and storing data, including digital databases and physical filing systems. It also mentions the need for regular audits and reviews to ensure the integrity of the information.

2. The second section focuses on the role of communication in achieving organizational goals. It highlights the importance of clear and concise communication, both internally and externally. The text provides guidelines for effective communication, such as using appropriate language, listening actively, and providing feedback. It also discusses the benefits of open communication and how it can foster a collaborative work environment.

3. The third part of the document addresses the challenges of managing resources efficiently. It identifies common pitfalls, such as overallocation and underutilization, and offers strategies to avoid them. The text emphasizes the need for careful planning and prioritization of tasks. It also discusses the importance of monitoring resource usage and making adjustments as needed. The goal is to ensure that resources are used effectively to achieve the organization's objectives.

4. The final section discusses the importance of continuous improvement and innovation. It encourages organizations to embrace change and seek out new opportunities for growth. The text provides examples of successful innovation initiatives and offers tips for fostering a culture of innovation. It also mentions the importance of staying up-to-date with industry trends and technologies. The overall message is that continuous improvement is key to long-term success.

EXHIBIT IV-8



As for the support of systems software, companies in Western Europe that are subsidiaries of larger companies with software support are tending not to include applications support in their future plans.

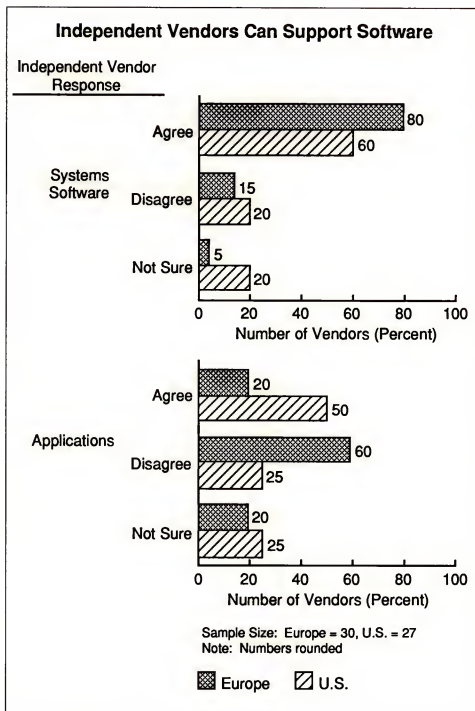
2. Independent Vendors Can Support Software

During the course of interviews, independent vendors were asked whether the independent companies could develop an effective software support capability that is effective in terms of providing an alternative to support provided by the software vendor. Answers to these questions are illustrated by Exhibit IV-9.

Data relating to systems software support are in agreement with data relating to current or planned activities, as illustrated in Exhibit IV-8. A



EXHIBIT IV-9



fairly high percent of the vendors in the U.S. and in Western Europe agree that independents can support system software and do currently provide that support.



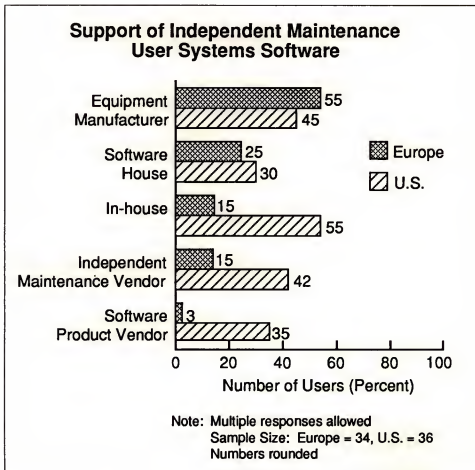
Although a high proportion of independent vendors are optimistic that an effective level of systems software support can be achieved, the mechanism for achieving this capability is less certain. This uncertainty is uncovered by vendor comments suggesting partnerships and cooperative agreements with software vendors as a possible solution.

Independent vendor opinions on their ability to provide an effective applications support capability are not only uncertain but also confused. For example, over 50% of independent vendors in Western Europe and 70% in the U.S. claim to currently offer or plan applications support, but only 20% of the vendors in Western Europe and 50% in the U.S. agree that the independent can provide an effective support capability. It appears that independent vendors are relatively confident in their ability to provide a limited and specifically focused applications support, but independents retain doubts related to the general support of applications.

3. Support of Independent Maintenance Users' Software

Analysis of the sample of users, in terms of which vendor supports which user's software, is provided by Exhibit IV-10.

EXHIBIT IV-10





Much higher percentages were seen in the U.S. for users contributing more to the support of their system software and allowing the independent maintenance vendor to provide more support than in Western Europe. The U.S. market appears to rely less on the equipment vendor and more on the software product vendor, independent vendors, and in-house group for support. Two possible explanations may be:

- Users of independent maintenance may develop a more open attitude to independent service vendors. This could be due to successful experiences of independent maintenance.
- Users that contract with independent maintenance companies may have a preference to be more independent of, and hence less reliant on, their equipment vendors.

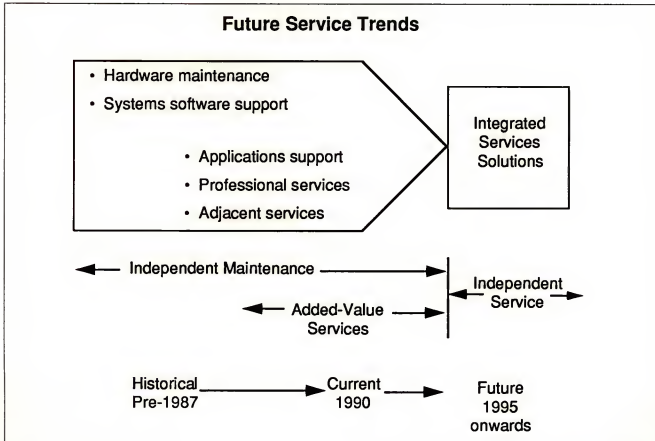
D

Long-Term Trends

1. Future Service Development

Exhibit IV-11 presents INPUT's view of the future evolution of customer service within the information services industry, an evolution that may signify a long-term crisis for independent maintenance companies.

EXHIBIT IV-11





Prior to 1987, customer services vendors were primarily providers of equipment maintenance and systems software support; equipment maintenance was the primary source of revenue. Other services were available on an informal basis but these were more often provided free of charge to support the sales activity. Toward the 1987 timeframe, the growth of equipment maintenance revenues started to decline as a consequence of market competition, falling equipment costs, and increased equipment reliability. Due to the dominance of maintenance as a source of revenue, customer service revenues growth also started to decline.

As product prices continued to fall in the latter half of the 1980s, together with profit margins on maintenance, customer services organizations were pressured to become more cost-effective. As a result of this trend, resources providing previously free additional services could no longer be funded by companies. Over the last three years, customer services organizations, in a search for additional revenue opportunities to supplement a decline in maintenance growth, formalized and enhanced these additional services to provide a chargeable range of service offerings to users. These services became identified as value-added services.

Part of the reason for declining maintenance revenues and profit has been the success of independent maintenance companies in increasing their market shares. This pattern is forecast by INPUT to continue from 1990 to 1995.

However, market conditions are changing due to the increasing reliability of equipment and consequent reduction in the importance of and requirement for equipment maintenance. Changing market conditions are also due to the increased emphasis on nonmaintenance services. As a result of these changing market conditions, equipment maintenance will, in future, decrease significantly as a source of income to service vendors and likely cease to be the primary source of service revenues.

The period 1990 to 1995 will likely see increasing emphasis on added-value services and will likely involve an evolution into the provision of integrated service solutions. The provision of integrated service solutions implies that service will be offered in a packaged form that comprises a mix of maintenance, software support, professional services, and adjacent services such as disaster recovery and systems operations.

The likely impact of this evolution on independent maintenance vendors, as a consequence of reduced importance of equipment maintenance, signals a potential crisis for independent maintenance companies. Companies that fail to recognize this evolution or implement contingency plans will likely see a rapid decline in revenues.

Independent maintenance companies that cannot adapt to the challenges of the second half of the 1990s will be acquired by other companies, become fourth-party maintenance companies, or cease operations.

Independent companies will continue to enjoy good growth opportunities, but independent maintenance will evolve to become independent service. Doubts exist over the ability of the independent maintenance companies to undergo the required metamorphosis from independent maintenance to independent service.

Companies most likely to adapt to this change are those supported by larger parent companies possessing the required skills and capability to support this evolution.

Evidence to support this evolution of the service markets is as follows:

- INPUT forecasts that equipment maintenance will grow at 4% CAGR over the period 1990 to 1995. This figure includes inflation; therefore, the equipment maintenance market is stagnant or perhaps declining.

2. Adaptation Is the Key to Long-Term Opportunities

Exhibit IV-12 provides a model indicating the requirements for the evolution from independent maintenance to independent service.

This exhibit illustrates the revenue structure of a typical independent maintenance company in 1990. Typically, independent maintenance companies gain about 80% or more of their revenues from equipment maintenance.

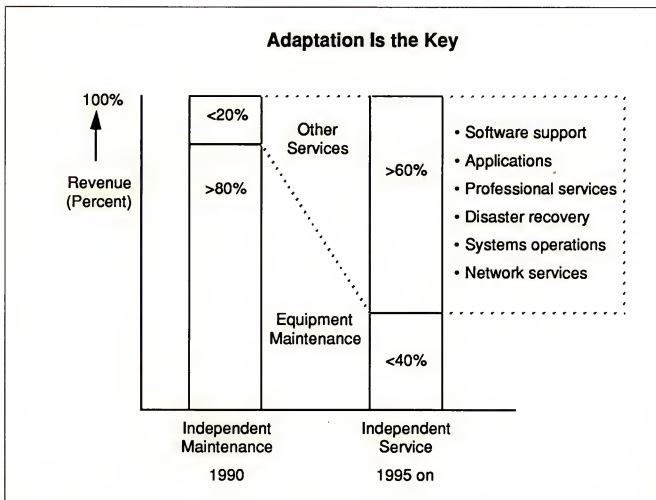
In order to adapt to the change from independent maintenance to independent service, the independent companies need to achieve two structural changes.

- Restructure the service capability of the company to provide a range of nonmaintenance services
- Restructure to reduce the reliance on equipment maintenance revenues

However, one major doubt exists over the ability of the independent maintenance companies to compete with equipment vendors in providing software support. The required skills are in short supply, and acquiring maintenance companies is very different from acquiring software companies.



EXHIBIT IV-12









The Success of Independent Maintenance



The first part of the paper discusses the importance of understanding the cultural context of the research. It highlights the need for researchers to be sensitive to the values and beliefs of the communities they are studying. This is particularly important in the field of education, where cultural differences can significantly impact learning outcomes.

The second part of the paper focuses on the methodology used in the study. It describes the qualitative approach adopted, which involves in-depth interviews and focus group discussions. The researchers aimed to explore the experiences and perceptions of the participants, rather than testing a specific hypothesis.

The third part of the paper presents the findings of the study. It discusses the various themes that emerged from the data, such as the role of family in education and the influence of community norms. The researchers found that there were significant differences in the way that different cultural groups viewed education and learning.

The final part of the paper discusses the implications of the findings for future research and practice. It suggests that researchers should continue to explore the cultural context of education, and that educators should be aware of the cultural differences of their students. This will help to ensure that education is more effective and inclusive for all students.



The Success of Independent Maintenance

A

User Migration

1. The Attraction of Reduced Costs

The opportunity to reduce the costs of equipment maintenance is the major reason users decide to contract with independent maintenance vendors, as shown in Exhibit V-1. This move to reduce costs appears to have a greater impact in the U.S. than the Western European market, with 73% of the U.S. users reporting lower cost as one of the reasons they chose independent maintenance and 50% of the Western European sample reporting low cost as a reason to choose independent maintenance.

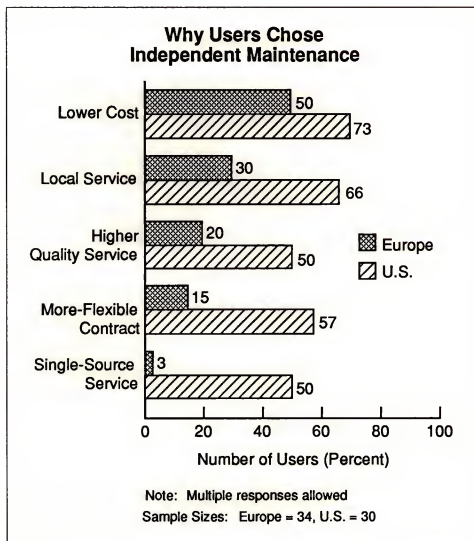
In 1988, 70% of the users interviewed in Western Europe reported cost as an important factor in their choice of an independent maintenance vendor. This mirrors the trends in the U.S., where cost and quality of service alternate in importance. Other factors influencing user choice of independent maintenance have increased in importance compared to the results of the 1988 study. These three factors are the provision of local service, higher quality service, and more flexible contracts. A higher percentage of users in Western Europe indicate these factors as a reason for choosing independent maintenance in 1990 compared with 1988.

The provision of single-source service is indicated as having reduced importance in Western Europe. INPUT believes the most likely reason for this reduction is the introduction of multivendor service by the equipment vendors. As a result of these introductions, the provision of single-source service by the independent vendors has lost a degree of competitive edge.

While single-source service has decreased in importance in Western Europe, a higher number of U.S. users (50%) report it as an important characteristic. Perhaps this discrepancy is due to the greater variety of



EXHIBIT V-1



vendor equipment installed in U.S. sites and the requirement to maintain this varied configuration.

There is also a greater demand for flexible contracts in the U.S. than in Western Europe, as evidenced by 57% of the U.S. users' mentioning that reason for choosing independent maintenance and only 15% in Western Europe.

2. Equipment Vendor Recovery Opportunities

Based on data collected during interviews with independent maintenance users, INPUT was able to assess potential opportunities for equipment vendors to recover lost business. These opportunities, together with a number of related issues, are listed in Exhibit V-2.



EXHIBIT V-2

**Limited Opportunities for
Equipment Vendor Recovery**

- Business recovery opportunities
 - Equipment replacement time
 - Match independents' pricing
 - Provide true multivendor service
 - Match independents' responsiveness
- Software support not a problem
- Cost pressure on some sectors
 - User interest high
 - Doubts over vendor intent

Opportunities for equipment vendors to recover business lost to independent maintenance companies are limited. Four potential opportunities have been identified.

- The time when equipment is due for replacement is the most likely opportunity for equipment vendors to recover lost business. When the new equipment is installed, it is covered by the equipment vendor's warranty, usually for twelve months. During this time, the equipment vendor has the opportunity to demonstrate service capability and develop user confidence. However, once the warranty period expires, the vendor will still likely be competing with the independent vendor for the ongoing service contract. A follow-on contract being awarded to the equipment vendor is not automatic. The vendor will be expected to demonstrate a capability of matching the independent vendor's service capability. Providing extended-warranty coverage has been one manner in which many equipment vendors have been able to delay the possible entrance of independent vendors. There has been an increase in the announcements of extended-warranty coverage by many equipment vendors as vendors combat the entrance of independent maintenance vendors.
- Matching the independent vendors' pricing is often a difficult issue for the equipment vendor to address, especially as the equipment vendor's overhead is likely to be higher. The probability that the independent



vendor is already providing lower-cost service suggests that the equipment vendor would be required to offer a substantial discount. Profitability considerations may indicate that the equipment vendor is unable to compete.

- Some users doubt the ability of some equipment vendors to provide true multivendor service. This is especially true in cases where the installed equipment is unique or nonstandard, and instances were quoted where equipment vendors had declined responsibility for such equipment. Independent vendors are seen by users to be more flexible and able to adapt to multivendor environments. Independent vendors tend to provide multivendor service using their own resources, whereas the equipment vendors tend to subcontract maintenance of other vendors. The result is that some users tend to view equipment vendor multivendor service as a palliative.
- Users claimed that equipment vendors need to improve their responsiveness, not only response time performance but also responsiveness to user needs. Users indicate that independent vendors tend to be very flexible and responsive to user needs in providing the type and level of service required. Independent vendors are seen to be able to adapt to user needs and to provide flexible service customized to meet the needs of individual users. Equipment vendors are seen by users to be more inclined to promote standard service offerings.

Independent maintenance users claimed their use of independent maintenance had not resulted in any problems related to software support. Data collected by INPUT in Western Europe indicates that a lower percentage of independent maintenance users in Europe rely on the equipment vendor for systems software support. The sample of users interviewed indicated that about 55% retained equipment vendor support for their systems software. This figure compares with 70%, which is the overall average calculated from INPUT's 1989 survey of 1,625 computer users in Western Europe.

Some users are subject to senior management pressures to reduce the cost of computer maintenance, particularly in the government/public utility and education industry sectors. This trend is tending to force users to seek alternative sources of maintenance to those provided by the equipment vendors. One example of this trend was provided by a university in Spain. Prior to contracting with an independent maintenance vendor, the university had sufficient budget to provide contracted maintenance on only 15% of its computer equipment. By contracting with an independent vendor, the university was able to cover the total base of installed equipment with a maintenance contract.

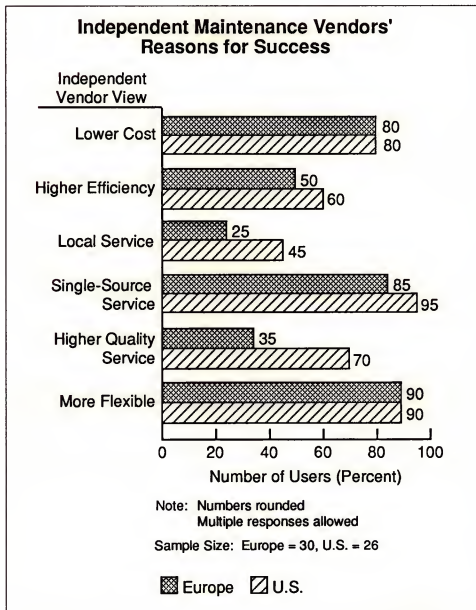


Although users of independent maintenance expressed relatively high levels of interest in equipment vendor multivendor service offerings, they also expressed a cynical view of the equipment vendors' intent to provide the level and flexibility of service required. Users interviewed tended to believe that independent maintenance is a long-term (3-to-5-year) solution.

3. Independent Vendor Recipe for Success

Exhibit V-3 illustrates the reasons why independent vendors believe they are successful in competing against equipment vendors.

EXHIBIT V-3





Primary reasons claimed by independent vendors for their success are the ability to provide:

- Lower-cost service
- Single-source service
- More-flexible service
- Higher-quality service (in the U.S.)

In provision of these services, independent vendors are comparing themselves with equipment vendors. In Western Europe, there is conflict between the reasons claimed by the independent vendors and those claimed by the users of independent maintenance; independent vendors may have misread the market. This conflict concerns the relative importance of multivendor service. From the user viewpoint, the provision of multivendor service in the Western European market is not an important reason for choosing independent maintenance. Most likely the independent vendors have failed to recognize the loss of competitive edge following the introduction of multivendor service by equipment vendors.

In the U.S., there is not quite as much conflict. The greatest difference in user versus independent vendor views was in the area of single-source service; 50% of the users listed single-source service as important and 95% of independent vendors thought it was important. A second area where the views were wide apart was flexibility—57% of users listed flexibility as important and 90% of vendors believed it to be important. The independent vendors at this time do not realize how important local service is to users. Sixty-six percent of users thought that having local service was an important factor in their choice of independent maintenance, whereas only 45% of the independents list it as a factor.

In Western Europe, the provision of local service rates as the second most important reason, from the user's point of view, why users chose independent maintenance. The independent vendors appear not to rate this aspect of their service capability very high.

B

Independent Vendor Market Response

1. Marketing Successes

a. User Advantages

Exhibit V-4 lists the strengths of independent vendors according to users of independent maintenance in the U.S. and Western Europe. These strengths have been listed in order of importance.

The major strength of independent maintenance identified by users in the U.S. was price. The independent maintenance vendor was viewed as providing the best service for the price. Lower cost was also an issue given in Exhibit V-1 as one of the important reasons why users go to independent maintenance service.



EXHIBIT V-4

Independent Vendor Strengths

U.S.	Europe
1. Price	1. Responsive to user needs
2. Quality/Reliable Service	2. Provision of multivendor service
3. Technical Knowledge	3. Availability of independent and unbiased advice
4. Responsive to User Needs	4. Provision of quality service and professionalism
5. Coverage—Single Source	

Quality/reliable service and the technical expertise of the staff were listed as the second- and third-most important strengths of the independent maintenance vendor. Users perceive the independent as providing higher quality service with better technical knowledge.

The independent is also viewed as more responsive to user needs and providing required flexibility in coverage and contracts.

Single-source coverage was also listed by users of independent vendor service as one of the strengths of the independent vendor. This is an important factor in the multivendor environment, where in the past it had been difficult to coordinate service and stay away from "finger-pointing" in times of difficult fault determination.

The major strength of independent maintenance identified by users in Western Europe was the responsiveness of independent vendors. Responsiveness means understanding user needs and structuring a flexible and customized service offering to meet the needs of specific users. Users compared this aspect of independent vendor service favorably to the approach adopted by the equipment vendors, who are biased toward more-standardized service offerings.

In-depth interviews with users indicated that the provision of multivendor service was rated higher in importance than was revealed by other data. This high rating may, however, be a slight distortion due to indications by users during in-depth interviews that a proportion of unique or slightly nonstandard equipment was installed on those sites. Users intimated that



equipment vendors do not provide true multivendor service, particularly where the installed equipment is in some way unique. Users claim that situations of this type result in the equipment vendor's declining to provide service for slightly nonstandard equipment. Users claim that independent vendors are prepared to accommodate this type of situation, and it may be that the independent-vendor multivendor offering remains competitive in this environment.

The ability and willingness of independent vendors in Western Europe to provide independent and unbiased advice rated quite high as a strength with users. This aspect of the independent vendor's ability refers to advice on new installations or replacement equipment. Users believed that equipment vendors are too heavily biased toward the vendor's own products.

Users in Western Europe also claimed that the degree of professionalism displayed by independent vendors and the ability to provide quality service also rated high as important strengths of the independent maintenance vendor. In judging quality service, users were expressing an opinion related to value for money.

b. Aggressive Sales Profile

Exhibit V-5 identifies the key characteristics of the sales profile that has been adopted by the independent vendors.

EXHIBIT V-5

Independent Vendors' Sales Profile

6 1/2% of headcount in sales

\$1.2 M revenue per sales head

\$ 74 K revenue per employee

The success of independent maintenance in the U.S. and Western Europe has been due, to a large degree, to the aggressive approach adopted by independent vendors to the dedicated sales and marketing of their equipment maintenance services. The dedication factor extends to the fact that, in many companies, the sales staff of the independent vendors is also dedicated to the exclusive sale of equipment maintenance. This approach compares to that of the equipment vendors, whose sales staff views the sale of service as a secondary task to the sale of computer products.



That the sales activity of the independent vendors is highly general can be demonstrated by a comparison with IBM. The equipment maintenance revenues of IBM in Western Europe in 1990 are estimated by INPUT to be in the region of \$2,700 million. Using a similar profile of \$1.2 million per sales head, IBM would be required to have almost 2,300 sales people in Western Europe dedicated to the sale of equipment maintenance.

2. Marketing Challenges

a. User Reluctance

Exhibit V-6 lists the major challenges that independent vendors believe they must address in order to continue expanding their businesses.

EXHIBIT V-6

Independent Vendor Major Challenges

- 50% believe:
 - Users satisfied with equipment vendor service
 - Lack of software support
 - User contractual ties with equipment vendor
 - User fear of equipment vendor response
- 25% believe equipment vendor has perceived service advantage

About 50% of independent vendors believe that the major challenge is a need to change the attitude of users to independent maintenance. The list in Exhibit V-6 indicates that the independent vendors still believe there is an issue related to the credibility of independent maintenance as a viable alternative to equipment vendor service.

INPUT believes the major factor limiting credibility of independent maintenance is the lack of effective system software support capability. Even though users of independent maintenance claim that their moving to independent maintenance has not created any problems in obtaining software support, data indicate that these users tend to be less reliant on the equipment vendors for this service. Nevertheless, these users also commented on the credibility of independent vendor software support.



Additionally, about 40% of independent vendors claim that users are unaware of the availability or benefits of the independent maintenance. INPUT believes that this figure is an overstatement by the independent vendors. Research conducted by INPUT in 1988 indicated that this figure was under 10% in a sample of almost 1,400 users throughout Western Europe.

b. Independent Vendor Weaknesses

The weaknesses of independent vendors identified by users are listed in Exhibit V-7.

EXHIBIT V-7

Independent Vendor Weaknesses

U.S.	Europe
<ul style="list-style-type: none">• Spare parts• Knowledge of system advances	<ul style="list-style-type: none">• Software support credibility factor• Risk of overexposure• Larger companies run risk of losing user friendliness• Lack of intimate product knowledge

In the U.S., the main weakness of the independent vendor was spare parts availability. In the 1989 study of third-party maintenance users, the availability of spare parts had a high importance rating of 8.1 to users, with only 58% of users satisfied with the spares availability they received.

Another weakness of concern to users of independent maintenance was knowledge of system advances and the knowledge of engineers regarding enhancements in hardware.

In the Western European sample, in addition to the weaknesses listed in Exhibit V-7, a significant proportion of users claimed they had not experienced any serious weakness in the independent vendors servicing their computer equipment.



The credibility of independent vendors' software support was the major weakness identified by users in Western Europe. Although most users expressed the opinion that independent vendors could support systems software, users also felt that the credibility of this support was a key issue. INPUT concludes from these comments that although independent maintenance users would be prepared to contract software support to the independent vendor, they would do so only after the risk factors had been minimized and the support capability successfully demonstrated.

A further weakness of independent maintenance identified by users concerned the risk of independent vendors' being overexposed. Users expressed an opinion that independent vendors are vulnerable to having resources spread too thinly, too thinly in terms of the wide range of equipment maintained and the wide geographic area that some independent vendors attempt to cover.

One user concern is that as large independent companies are established, they will lose the image of being a friendly local company. Users expressed the opinion that as the independent companies grow, they will develop a sluggishness due to increased bureaucratic inertia and will lose the competitive edge they once retained by being more responsive than the equipment vendors. At the extreme this could be interpreted as developing a degree of homogeneity with the equipment vendors.

Even though users expressed satisfaction with independent vendor service, a minority claimed that independent vendors lacked the intimate product knowledge of the equipment manufacturers. This lack could be a negative aspect of independent vendor service when a service company must define subtle equipment faults and resolve complex compatibility problems.

c. Key Issues Facing Independent Vendors

Exhibit V-8 lists, in the independent vendors' opinion, the key issues that they are confronted with in the U.S. and Western Europe.

The major issue raised by vendors was competition—competition related to price and competition between vendors. One consequence of a market becoming relatively well developed is an increase in the intensity of competition. The independent vendors are being subjected to competitive pressure from a number of directions:

- The implementation of multivendor service offerings by the equipment vendors, which has resulted in the independents' losing a degree of competitive advantage.



EXHIBIT V-8

Key Issues Raised by Independent Vendors

U.S. Vendor Issue	European Vendor Issue
<ul style="list-style-type: none">• Competition<ul style="list-style-type: none">- Pricing- Vendor- Maintaining profit margins• Service market demands<ul style="list-style-type: none">- Full range- Single source- Customized services• Service management<ul style="list-style-type: none">- Spare parts- Account management• Alliances/mergers	<ul style="list-style-type: none">• Competition<ul style="list-style-type: none">- Pricing- Vendor• New technology<ul style="list-style-type: none">- Difficulty diagnosing faults- Reduced profit margins- Investment• Need for quality service• Small vendor credibility• Acquisition activity

- Equipment vendors are adopting a more-flexible approach to pricing and are also, claim the independent vendors, offering substantial price discounts. Discounts as high as 30% were quoted.
- Competition between vendors is becoming more intense as the battle for market share develops. One example quoted by an independent vendor was related to the typical tendering process for a large contract, a situation whereby up to four independents and three equipment vendors compete.

Maintaining profit margins was also quoted by independent vendors in the U.S. as an important issue. In view of price competition between independents and the competition with equipment vendors for service contracts, many independents have seen falling profit margins in just maintaining their current market share of customers.



In the U.S., service market demands were reported as serious concerns for independent vendors. Users requiring a full range of services and single-source, customized service solutions have posed many concerns for the independent trying to maintain account base. The multivendor environment has created a host of special situations that must be met by the servicing vendor. The situations include specialized communications equipment and the increasing complexity of installed networks, both local area and wide area.

Service management issues of spare parts availability, the stocking of spare parts in convenient locations, and the distribution of parts were issues mentioned by vendors. Not only must vendors have spare parts to maintain equipment, but parts need to be in a convenient location that will enable vendors to respond quickly. Account management becomes an issue in times of subcontracting and alliances with other service vendors. Servicing the account and keeping up with the requirements of the user are other areas where vendors need to be concerned. The vendor has to keep on top of the requirements of the users and be able to meet requirements before another vendor steps in and takes the account.

In the U.S., alliances and mergers are changing the major players in the market. Many of the smaller firms have had to look at alliances as one way to remain viable. The merger of companies has also been used to keep smaller companies in the independent maintenance market before being forced out of business or acquired by larger firms.

In the Western European market, the AS/400 was quoted as an example of how new technology is causing problems for independent vendors in Western Europe. Problems arise because the complexity and interrelation between equipment subassemblies makes the diagnosis of faults imprecise.

The falling cost of computer equipment is promoting an expectation among users that service costs will also fall substantially. Independent vendors claim that falling product prices and competitive pressures are reducing profit margins. Reduced profit margins are also a consequence of the investment required in providing the service tools needed to service new-technology equipment. The escalating cost of spare parts for equipment that is heavily modularized also impacts profitability because of the level of investment required. The Field Replaceable Unit (FRU) level of service parts is becoming more and more complex and costly.

Independent vendors have recognized the user need for quality service and claim there is increasing conflict between competitive pricing and quality of service provided. This conflict matches a similar situation that INPUT identified in 1989 when studying the major quality issues concerning equipment vendors in Western Europe. In this study, INPUT



identified an equipment vendor conflict that can be summarized as follows:

- 55% of equipment vendors believe the price users are prepared to pay restricts the quality of service that can be delivered, or will be restrictive if there is any further pressure on pricing.

Smaller independent vendors claim that there is a credibility issue involved where they are compared with the larger pan-European companies.

The fact that some independent vendors believe that acquisition activity has passed its peak was raised as an issue. This issue seems to focus on the lack of availability of significant acquisition targets, therefore forcing vendors to concentrate on a combination of organic growth and the acquisition of smaller companies. Quantum leaps of growth by acquisition appear to be unlikely now that the major independent companies are established.



Appendixes





Profiles of Belgian Independent Vendors









COMPANY PROFILE

ECONOCOM SERVICES

Belgium

Brixton Laan 22-24

1930 Zaventem

Country Code (32) Area Code (2)

Number: 720 9820

Company Information

Number of service centres:	5
Number of employees in maintenance:	105
Number of engineers:	45
- Field engineers:	41
- Bench engineers:	4
Number of sales personnel:	25

Revenues derived from maintenance

- 1989 Revenues:	BF 352.00 million
- 1990 Forecast:	BF 487.00 million
Total revenues	
- 1989 Revenues:	*BF 3.00 billion
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	IBM 43XX to 309X
Minicomputers:	IBM S36, S38, AS/400
Business PCs:	IBM, Compaq, Toshiba, Apple, NEC, HP, Epson and all compatibles
Peripherals:	IBM and all compatibles
Other:	IBM Series 1, 8600

Notes: * Total for Europe

N/A = Not available



COMPANY PROFILE

GETRONICS SERVICE

Belgium

Research Park Zellik

Pontbeeklaan, 43

1730 Asse-Zellik (Brussels)

Country Code (32) Area Code (2)

Number: 467 1783

Company Information

Number of service centres:	4
Number of employees in maintenance:	70
Number of engineers:	56
- Field engineers:	30
- Bench engineers:	26
Number of sales personnel:	5

Revenues derived from maintenance

- 1989 Revenues:	BF 220 million
- 1990 Forecast:	BF 295 million
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM S3X, AS/400, Digital MicroVAX, MAI, Wang OIS/VS
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other:	Data communications equipment Network services

N/A = Not available



COMPANY PROFILE

**GRANADA COMPUTER SERVICES
(BELGIUM) N.V./SA**

Belgium

Hoge Wei 16

B 1930 Zaventem

Country Code (32) Area Code (2)

Number: 721 4893

Company Information	Number of service centres:	2
	Number of employees in maintenance:	89
	Number of engineers:	70
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel	6
Revenues derived from maintenance		
	- 1989 Revenues:	BF 385 million
	- 1990 Forecast:	N/A
Total revenues		
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers



COMPANY PROFILE

THYSSEN FIELD SERVICE

Belgium

Kestelstraat 194

B 9360 Buggenhout

Country Code (32) Area Code (52)

Number: 330160

Company Information	Number of service centres:	1
	Number of employees in maintenance:	18
	Number of engineers:	11
	- Field engineers:	9
	- Bench engineers:	2
	Number of sales personnel	3
Revenues derived from maintenance		
	- 1989 Revenues:	BF 101 million
	- 1990 Forecast:	BF 122 million
	Total revenues	
	- 1989 Revenues:	BF 122 million
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	As for the Netherlands
Minicomputers:	As for the Netherlands
Business PCs:	As for the Netherlands
Peripherals:	As for the Netherlands
Other Equipment:	As for the Netherlands



B

Profiles of French Independent Vendors



COMPANY PROFILE

CGEE (ATEMI)

France
 11 Bis Avenue Gabriel Peri
 BP 64
 78360 Montesson
 Country Code (33) Area Code (1)
 Number: 34 80 89 98

Company Information	Number of service centres:	29
	Number of employees in maintenance:	280
	Number of engineers:	250
	- Field engineers:	200
	- Bench engineers:	50
	Number of sales personnel	30

Revenues derived from maintenance

- 1989 Revenues:	FF 150 million
- 1990 Forecast:	FF 165 million
Total revenues	
- 1989 Revenues:	FF 13.6 billion
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers

N/A = Not available



COMPANY PROFILE

CSEE

France

8 Avenue du Parana

91120 Les Ulis

Country Code (33) Area Code (1)

Number: 69 07 08 80

Company Information

Number of service centres:	14
Number of employees in maintenance:	140
Number of engineers:	120
- Field engineers:	100
- Bench engineers:	20
Number of sales personnel	N/A

Revenues derived from maintenance

- 1989 Revenues:	FF 75 million
- 1990 Forecast:	FF 80 million
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Other Equipment: EFTPOS terminals, ATMs—Ingenico, Crouzet,
ESD, CSEE, ACD—Resean Coralys, Credicam—
Petif—Saphir

Note: Main activity is maintenance of banking equipment and EFTPOS terminals due to the interests of the mother company in this sector.



COMPANY PROFILE

DPM—ALPHADIS

France

6 Avenue Léon Harmel

92168 Anthony Cedex

Country Code (33) Area Code (1)

Number: 40 96 15 15

Company Information

Number of service centres:	11
Number of employees in maintenance:	50
Number of engineers:	32
- Field engineers:	N/A
- Bench engineers:	N/A

Revenues derived from maintenance

- 1989 Revenues:	FF 39 million
- 1990 Forecast:	FF 75 million

Type of equipment maintained

Mainframes:	IBM 43XX
Minicomputers:	IBM S34, S36, S38, Bull DPS 6, DPS 4
Business PCs:	IBM, Apple, Toshiba
Peripherals:	Telex, ITT, Memorex, STC
Other Equipment:	IBM, Memorex, Bull



COMPANY PROFILE

ECONOCOM FRANCE

France

52 Avenue du Vieux Chemin de St. Denis

92390 Villeneuve-La-Garenne

Country Code (33) Area Code (1)

Number: 47 94 96 07

Company Information

Number of service centres:	19
Number of employees in maintenance:	96
Number of engineers:	70
- Field engineers:	53
- Bench engineers:	17
Number of sales personnel:	11

Revenues derived from maintenance

- 1989 Revenues:	FF 45 million
- 1990 Forecast:	FF 70 million
Total revenues	
- 1989 Revenues:	FF 45 million
- 1990 Forecast:	FF 70 million

Type of equipment maintained

Mainframes: IBM 43XX to 308X

Minicomputers: IBM S34, S36, S38, AS/400

Business PCs: IBM, Apple, Compaq, Toshiba and other compatibles

Peripherals: IPL, EMC², Idea, Printronix, Genicom, Kyocera, HP, Epson, Fujitsu



COMPANY PROFILE

GRANADA COMPUTER SERVICES SA

France

50/64 Avenue Francois Arago

92000 Nanterre

Country Code (33) Area Code (1)

Number: 47 60 47 60

Company Information	Number of service centres:	25
	Number of employees in maintenance:	290
	Number of engineers:	152
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel	22
	Revenues derived from maintenance	
	- 1989 Revenues:	FF 180 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers

Note: France is also the headquarters of Granada Southern Europe operations.



COMPANY PROFILE

METROSERVICE

France

77-101 Ave du Vieux Chemin St. Denis

BP 102

92232 Gennevilliers Cedex

Country Code (33) Area Code (1)

Number: 47 85 55 55

Company Information	Number of service centres:	24
	Number of employees in maintenance:	N/A
	Number of engineers:	201
	- Field engineers:	140
	- Bench engineers:	32
	Number of sales personnel	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	FF 160 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	FF 160 million
	- 1990 Forecast:	N/A

Type of equipment maintained

Business PCs: All major manufacturers

Peripherals: All major manufacturers



COMPANY PROFILE

RECOGNITION SA DIVISION MDS

France

197 Rue de Bercy

Tour Gamma B

75582 Paris Cedex 12

Country Code (33) Area Code (1)

Number: 40 04 55 55

Company Information

Number of service centres:	3
Number of employees in maintenance:	N/A
Number of engineers:	110
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel	N/A

Revenues derived from maintenance

- 1989 Revenues:	FF 2.0 million
- 1990 Forecast:	FF 2.5 million
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Convergent Technology
Business PCs:	Convergent Technology, Victor, Normarel
Peripherals:	Convergent Technology, Bull, NEC, Kyocera, MAC Data, 3270-compatible screens and printers

Note: Started independent maintenance operations in October 1988.
Main business is selling equipment and the maintenance of these products.

The first part of the paper discusses the importance of the study and the objectives of the research. It highlights the need for a comprehensive understanding of the subject matter and the role of the researcher in this process. The second part of the paper presents the methodology used in the study, including the data collection methods and the analysis techniques. The third part of the paper discusses the results of the study and the conclusions drawn from the findings. The final part of the paper provides a summary of the key points and offers suggestions for future research.

The study was conducted in a systematic and rigorous manner, following the principles of scientific research. The data was collected from a large sample of participants, ensuring the representativeness of the findings. The analysis was performed using advanced statistical techniques, allowing for a detailed examination of the data. The results of the study are presented in a clear and concise manner, highlighting the key findings and their implications. The conclusions drawn from the study are based on a thorough analysis of the data and are supported by the findings. The study has important implications for the field and offers valuable insights into the subject matter. Future research should build on the findings of this study and explore new areas of inquiry.

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COMPANY PROFILE

SORBUS FRANCE

France

Rue Jules Saulnier

93200 St. Denis

Paris

Country Code (33) Area Code (1)

Number: 48 09 23 23

Company Information

Number of service centres:	12
Number of employees in maintenance:	185
Number of engineers:	150
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel	N/A

Revenues derived from maintenance

- 1989 Revenues:	FF 110 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Wide range of equipment, from PC to mainframe



COMPANY PROFILE

SPECTRAL MIS

France

17 Boulevard Ney

75018 Paris

Country Code (33) Area Code (1)

Number: 40 38 36 34

Company Information

Number of service centres:	60
Number of employees in maintenance:	485
Number of engineers:	220
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	FF 234 million
- 1990 Forecast:	FF 280 million
Total revenues	
- 1989 Revenues:	FF 2,298 million
- 1990 Forecast:	FF 2,750 million

Type of equipment maintained

Mainframes:	IBM, Bull
Minicomputers:	IBM, Bull, Altos, Pertec
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	EFTPOS and ATM terminals

Note: Total revenues refer to the parent company Groupe Concept SA, which acquired Spectral and MIS in early 1989.



COMPANY PROFILE

TASQ

France

6 Rue des Coutures

Z.I. Sud

77200 Torcy

Country Code (33) Area Code (1)

Number: 60 17 38 25

Company Information	Number of service centres:	20
	Number of employees in maintenance:	N/A
	Number of engineers:	90
	- Field engineers:	81
	- Bench engineers:	9
	Number of sales personnel:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	FF 65 million
	- 1990 Forecast:	FF 90 million
	Total revenues	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers: Bull, Mini 6, DPS 6, Northern Telecom, Stena

Business PCs: Bull, SMT, IBM and compatibles

Other Equipment: LANs, ATMs



COMPANY PROFILE

THOMAINFOR

France

8 Rue Grange Dame Rose

78140 Vélizy-Villacoublay

Country Code (33) Area Code (1)

Number: 30 70 77 00

Company Information

Number of service centres:	90
Number of employees in maintenance:	1,004
Number of engineers:	950
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	60

Revenues derived from maintenance

- 1989 Revenues:	FF 450 million
- 1990 Forecast:	FF 870 million
Total revenues	
- 1989 Revenues:	FF 450 million
- 1990 Forecast:	FF 870 million

Type of equipment maintained

Mainframes:	IBM, Digital, Bull
Minicomputers:	IBM, Digital, Bull, Norsk Data, Sun, HP/Apollo, Prime, FPS, AT&T, MAI, Wang, Datapoint
Business PCs:	All IBM compatibles
Peripherals:	All major manufacturers
Other Equipment:	Check reader/sorters (BTI) Sintra Computers

Note: Due to the multiplicity of acquisitions in the second half of 1989, it is not possible to split Thomainfor data by country. These data refer to total Western Europe.







Profiles of German Independent Vendors





COMPANY PROFILE

ECONOCOM

Germany

Otto Hahn Strasse 123

6070 Langen

Country Code (49) Area Code (6103)

Number: 7050

Company Information

Number of service centres:	10
Number of employees in maintenance:	80
Number of engineers:	55
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	5

Revenues derived from maintenance

- 1989 Revenues:	DM 8.1 million
- 1990 Forecast:	DM 10.0 million
Total revenues	
- 1989 Revenues:	DM 15.0 million
- 1990 Revenues:	DM 17.5 million

Type of equipment maintained

Mainframes:	IBM 308X
Minicomputers:	IBM S34, S36, S38, AS/400
Business PCs:	IBM
Peripherals:	IBM, Centronics, Lynk

Note: Remote diagnostic support introduced in April 1989.

N/A = Not available



COMPANY PROFILE

FORUM

Germany

Johann G. Gutenberg Strasse, 33

D-8037 Olching

Country Code (49) Area Code (8142)

Number: 28031

Company Information

Number of service centres:	3
Number of employees in maintenance:	21
Number of engineers:	14
- Field engineers:	12
- Bench engineers:	2
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	DM 3.0 million
- 1990 Forecast:	DM 3.5 million

Type of equipment maintained

Mainframes:	Digital VAX 8250, 8350
Minicomputers:	Digital VAX 7XX, MicroVAX II, MicroVAX 2000, 3000, PDP—Q-bus and Uni-bus
Business PCs:	IBM and IBM-compatibles
Peripherals:	Digital, Fujitsu, NEC, Maxtor, Cipher, Kennedy, Pertec, Emulex, Alphatronics
Other Equipment:	Communications—Xyplex, Emulex



COMPANY PROFILE

GRANADA COMPUTER SERVICES GmbH

Germany

Untergasse 74

6097 Trebur-Giensheim

Country Code (49) Area Code (61)

Number: 47 2090

Company Information	Number of service centres:	23
	Number of employees in maintenance:	158
	Number of engineers:	110
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel:	16
	Revenues derived from maintenance	
	- 1989 Revenues:	DM 29 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	N/A
	- 1990 Revenues:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers

Notes: West Germany is also the headquarters of Granada Mid-Europe operations at AM Sudpark 31, 4040 Neus 1, Telephone (49) 2101 465392



COMPANY PROFILE

MULTITECH COMPUTER SYSTEMS

Germany

Niederurseler Allee 8-10

D-6236 Eschborn 1

Country Code (49) Area Code (6196)

Number: 70120

Company Information

Number of service centres:	11
Number of employees in maintenance:	50
Number of engineers:	30
- Field engineers:	23
- Bench engineers:	7
Number of sales personnel:	2

Revenues derived from maintenance

- 1989 Revenues:	DM 7.0 million
- 1990 Forecast:	DM 7.0 million
Total revenues	
- 1989 Revenues:	DM 10.5 million
- 1990 Revenues:	DM 10.5 million

Type of equipment maintained

Business PCs:	IBM, IBM compatibles, Tandon, Mitac
Peripherals:	Dataproducts, Printronix, Dataprinter
Other Equipment:	LANs—Novell, token ring



COMPANY PROFILE

SORBUS GmbH

Germany

Josefinstrasse, 13

D 400 Dusseldorf

Country Code (49) Area Code (211)

Number: 139 080

Company Information

Number of service centres:	16
Number of employees in maintenance:	120
Number of engineers:	90
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	DM 19.1 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Revenues:	N/A

Type of equipment maintained

Wide range of equipment, from PC to mainframe



COMPANY PROFILE

TELUB BITRONIC

Germany

Stahlenbergerweg, 16

6000 Frankfurt am 70

Country Code (49) Area Code (69)

Number: 618056

Company Information

Number of service centres:	7
Number of employees in maintenance:	70
Number of engineers:	56
- Field engineers:	27
- Bench engineers:	29
Number of sales personnel:	3

Revenues derived from maintenance

- 1989 Revenues:	DM 8 million
- 1990 Forecast:	DM 10 million
Total revenues	
- 1989 Revenues:	DM 8 million
- 1990 Revenues:	DM 10 million

Type of equipment maintained

Minicomputers:	Cromenco, Convergent Technology, Datagraph, IBM
Business PCs:	Minolta, Sharp, IBM, Tandon, Victor, Panasonic
Peripherals:	AST Research, Dataproducts, Genicom, Centronics, Fujitsu

Note: Revenue includes fourth-party maintenance revenues.





Profiles of Italian Independent Vendors





COMPANY PROFILE

CIESSE CONTROL SYSTEM SPA

Italy

Via Venezia 67/G

35129 Padova

Country Code (39) Area Code (49)

Number: 807 14477

Company Information	Number of service centres:	16
	Number of employees in maintenance:	190
	Number of engineers:	96
	- Field engineers:	80
	- Bench engineers:	16
	Number of sales personnel:	32

Revenues derived from maintenance

- 1989 Revenues:	Lira 14 billion
- 1990 Forecast:	Lira 16 billion
Total Revenues	
- 1989 Revenues:	Lira 38 billion
- 1990 Forecast:	Lira 50 billion

Type of equipment maintained

Mainframes:	IBM 4381
Minicomputers:	IBM S34, S36, S38
Business PCs:	IBM
Peripherals:	IBM, Decision Data, Honeywell

Note: 100% owned by Olivetti.



COMPANY PROFILE

ECONOCOM MANUTENZIONE

Italy

Via Carducci 43

20099 - Sesto S. Giovanni

Milano

Country Code (39) Area Code (2)

Number: 2622 0041

Company Information

Number of service centres:	3
Number of employees in maintenance:	60
Number of engineers:	
- Field engineers:	40
- Bench engineers:	N/A
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1988 Revenues:	Lira 6.5 billion
- 1989 Forecast:	N/A
Total Revenues	
- 1988 Revenues:	Lira 170 billion (approx.)
- 1989 Forecast:	N/A

Type of equipment maintained

Mainframes:	IBM 3033, 4381, 4341
Minicomputers:	IBM S34, S38, Series 1, AS/400
Peripherals:	IBM PS/2
Other Equipment:	All IBM peripherals

N/A = Not available



COMPANY PROFILE

GRANADA COMPUTER SERVICE SPA

Italy

Via Quaranta 29

20141 Milan

Country Code (39) Area Code (2)

Number: 55 21 08 31

Company Information	Number of service centres:	4
	Number of employees in maintenance:	52
	Number of engineers:	31
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel:	4
Revenues derived from maintenance		
	- 1989 Revenues:	Lira 7.1 billion
	- 1990 Forecast:	N/A
	Total Revenues	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers



COMPANY PROFILE

IBIMAIN

Italy

Milanofiori

Palazzo E/4

Milan

Country Code (39) Area Code (2)

Number: 8224

Company Information	Number of service centres:	30
	Number of employees in maintenance:	350
	Number of engineers:	300
	- Field engineers:	280
	- Bench engineers:	20
	Number of sales personnel:	100

Revenues derived from maintenance

- 1989 Revenues: Lira 41 billion

- 1990 Forecast: Lira 48 billion

Total Revenues

- 1989 Revenues: Lira 108 billion

- 1990 Forecast: Lira 130 billion

Type of equipment maintained

Minicomputers: IBM, Digital, Bull

Business PCs: IBM and all compatibles

Peripherals: All manufacturers

Note: Ibimaint is 100% owned by Olivetti.



COMPANY PROFILE

SORBUS

Italy

Centro Direzionale

Milanofiori

Strada 7 Palazzo T3

Rozzano-Milano 20089

Country Code (39) Area Code (2)

Number: 822 701

Company Information

Number of service centres:	10
Number of employees in maintenance:	100
Number of engineers:	75
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel	N/A

Revenues derived from maintenance

- 1989 Revenues:	Lira 11.6 billion
- 1990 Forecast:	N/A
Total Revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Wide range of equipment, from PC to mainframe

The first part of the paper discusses the importance of the research and the objectives of the study. It then presents a literature review of the existing research on the topic. The second part of the paper describes the methodology used in the study, including the data collection and analysis techniques. The third part of the paper presents the results of the study, and the fourth part discusses the implications of the findings. The paper concludes with a summary of the main findings and a list of references.

The research was conducted in a systematic and rigorous manner, following the principles of good research practice. The data was collected from a large and diverse sample of participants, and the analysis was conducted using a range of statistical techniques. The results of the study are presented in a clear and concise manner, and the implications of the findings are discussed in detail. The paper is a valuable contribution to the field of research, and it provides a wealth of information for researchers and practitioners alike.

The study was funded by the National Science Foundation, and the authors would like to thank the reviewers for their helpful comments and suggestions. The authors also would like to thank the participants who took part in the study, without whom the research would not have been possible.





Profiles of Dutch Independent Vendors









COMPANY PROFILE

CIRCLE INFORMATION SYSTEMS

Netherlands
Gallileilaan 35
3584 BC Utrecht
Country Code (31) Area Code (30)
Number: 333 414

Company Information	Number of service centres:	5
	Number of employees in maintenance:	25
	Number of engineers:	21
	- Field engineers:	21
	- Bench engineers:	N/A
	Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	DFI 4.0 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Digital MicroVAX
Business PCs:	Philips, IBM, Tulip, Olivetti
Peripherals:	Printers and disk drives

Note: This company is 100% owned by Philips.

N/A = Not available



COMPANY PROFILE

ECONOCOM SERVICES

Netherlands

Paasheuvelweg 10

1105 B.H.

Amsterdam 20

Country Code (31) Area Code (20)

Number: 563 3333

Company Information	Number of service centres:	5
	Number of employees in maintenance:	95
	Number of engineers:	58
	- Field engineers:	40
	- Bench engineers:	18
	Number of sales personnel:	Use agents

Revenues derived from maintenance

- 1989 Revenues:	DFI 13 million
- 1990 Forecast:	DFI 15 million
Total Revenues	
- 1989 Revenues:	DFI 10.0 million
- 1990 Forecast:	DFI 12.0 million

Type of equipment maintained

Minicomputers:	IBM S34, S36, S38, AS/400
Business PCs:	IBM, Compaq, Zenith, Toshiba, Olivetti, NEC
Peripherals:	Centronics, Printronix, Lynk, Memorex

The first part of the paper discusses the importance of understanding the underlying mechanisms of the observed phenomena. It is argued that a comprehensive understanding of the system requires a detailed analysis of the various factors that influence its behavior. This involves identifying the key variables and their interactions, as well as the underlying processes that govern the system's dynamics.

In the second part, the authors present a series of experiments designed to test the proposed model. These experiments involve manipulating the input variables and observing the resulting changes in the system's output. The results of these experiments are compared with the predictions of the model, and the degree of agreement is discussed.

The third part of the paper focuses on the implications of the findings for the broader field of research. It is argued that the results of this study have important implications for our understanding of the system and its behavior. These implications are discussed in detail, and the authors provide a series of recommendations for future research.

Finally, the paper concludes with a summary of the main findings and a discussion of the limitations of the study. The authors acknowledge that there are several limitations to the current study, and they provide a series of suggestions for how these limitations might be addressed in future research.

COMPANY PROFILE

GETRONICS SERVICE

Netherlands

Donauweg 10

1043 AJ Amsterdam

Country Code (31) Area Code (20)

Number: 586 1420

Company Information

Number of service centres:	8
Number of employees in maintenance:	590
Number of engineers:	430
- Field engineers:	220
- Bench engineers:	210
Number of sales personnel:	12

Revenues derived from maintenance

- 1989 Revenues:	DFI 88 million
- 1990 Forecast:	DFI 110 million
Total Revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM 3X, AS/400, Digital MicroVAX, MAI, Wang OIS/VS, Altos, ARIX, Micro Five, NCR Tower
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	Data communications equipment Network services

COMPANY PROFILE

GRANADA COMPUTER SERVICES (Nederland) BV

Netherlands

Postbus 149

3454 ZJ De Meern

Country Code (31) Area Code (3406)

Number: 92211

Company Information

Number of service centres:	1
Number of employees in maintenance:	134
Number of engineers:	85
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel	7

Revenues derived from maintenance

- 1989 Revenues:	DFI 26 million
- 1990 Forecast:	N/A
Total Revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers

Note: The Netherlands is also the headquarters of Granada Northern Europe operations.



COMPANY PROFILE

K.H. SERVICES

Netherlands

1 Energieweg

NL 2627 AP Delft

P.O. Box 5080

NL 2600 GB Delft

Country Code (31) Area Code (15)

Number: 609999

Company Information

Number of service centres:	4
Number of employees in maintenance:	140
Number of engineers:	100
- Field engineers:	60
- Bench engineers:	40
Number of sales personnel:	10

Revenues derived from maintenance

- 1989 Revenues:	DFI 25 million
- 1990 Forecast:	DFI 30 million
Total Revenues	
- 1989 Revenues:	*DFI 2.7 billion
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Digital 7XX, MicroVAX II and III, 3500, Pertec, Quantel
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	CAD/CAM, plotters

Notes: - Name change; company was DTC Service.

* Part of the International-Müller Group, whose total revenues are quoted.

- Independent maintenance revenues include a small proportion from Belgium.

The first part of the paper discusses the importance of the research and the objectives of the study. It then presents a literature review of the existing research on the topic. The second part of the paper describes the methodology used in the study, including the data collection and analysis techniques. The third part of the paper presents the results of the study, which show that the research objectives have been achieved. The final part of the paper discusses the implications of the findings and provides recommendations for future research.

The research was conducted in a systematic and rigorous manner, following the principles of good research practice. The data was collected from a representative sample of the population, and the analysis was conducted using appropriate statistical methods. The results of the study are presented in a clear and concise manner, and the implications of the findings are discussed in detail.

The findings of the study have important implications for the field of research. They suggest that the research objectives have been achieved, and that the research has provided valuable insights into the topic. The results also suggest that there is a need for further research in this area, and that the findings should be used to inform policy and practice.

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COMPANY PROFILE

THYSSEN FIELD SERVICE

Netherlands

Postbus 670

3900 Veenendaal

Country Code (31) Area Code (8385)

Number: 35111

Company Information

Number of service centres:	1
Number of employees in maintenance:	62
Number of engineers:	43
- Field engineers:	27
- Bench engineers:	16
Number of sales personnel:	4

Revenues derived from maintenance

- 1989 Revenues:	DFI 14.2 million
- 1990 Forecast:	DFI 16.4 million
Total Revenues	
- 1989 Revenues:	DFI 21.0 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Digital PDP and VAX (except for 8XX and 9XX)
Business PCs:	Compaq, Apple, Olivetti
Peripherals:	Wyse, CDC, Fujitsu, Exabyte, Kennedy, Cipher, Mannesmann
Other Equipment:	Industrial equipment and compatible (i.e., Emmulex, Fujitsu, Maxtor, Clearpoint, System Industries, Dilog) Software maintenance on Digital





Profiles of Spanish Independent Vendors





COMPANY PROFILE

CERO MANTENIMIENTOS

Spain

Aragoneses, 7A

28100 Alcobendas

Madrid

Country Code (34) Area Code (1)

Number: 663 8352

Company Information

Number of service centres:	4
Number of employees in maintenance:	32
Number of engineers:	21
- Field engineers:	19
- Bench engineers:	2
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	Pta 220 million
- 1990 Forecast:	Pta 260 million
Total revenues	
- 1989 Revenues:	N/A
- 1990 Revenues:	N/A

Type of equipment maintained

Mainframes:	IBM 43XX
Minicomputers:	IBM S34, S36, S38, AS/400
Business PCs:	Various
Peripherals:	IBM for Systems 43XX, 3X and AS/400; compatibles

N/A = Not available

COMPANY PROFILE

ELTEC

Spain

Calle Caspe 144-146

08013 Barcelona

Country Code (34) Area Code (3)

Number: 212 5800

Company Information

Number of service centres:	27
Number of employees in maintenance:	310
Number of engineers:	229
- Field engineers:	180
- Bench engineers:	27
Number of sales personnel	10

Revenues derived from maintenance

- 1989 Revenues:	Pta 1,500 million
- 1990 Forecast:	Pta 2,500 million
Total revenues	
- 1989 Revenues:	Pta 1,500 million
- 1990 Revenues:	Pta 2,500 million

Type of equipment maintained

Minicomputers:	DEC VAX 7XX, MicroVax, PDP IBM S34, S36, S38
Business PCs:	IBM, Olivetti, Unisys, Tandon, Apple, Compaq, Bull, Epson, Groupil
Peripherals:	C. ITOH, AST, NCR, Facit, HP, Nixdorf, Epson, NEC, Olivetti

Note: ELTEC SA (France) and LUMA SA (Portugal) are new companies launched in January 1990.

Total number of engineers includes system support staff.



COMPANY PROFILE

GEMÁTICA

Spain

Buenaventura Muñoz No 31

08018 Barcelona

Country Code (34) Area Code (3)

Number: 485 1017

Company Information	Number of service centres:	4
	Number of employees in maintenance:	25
	Number of engineers:	18
	- Field engineers:	12
	- Bench engineers:	6
	Number of sales personnel	2
Revenues derived from maintenance		
	- 1989 Revenues:	Pta 170 million
	- 1990 Forecast:	Pta 340 million
	Total revenues	
	- 1989 Revenues:	N/A
	- 1990 Revenues:	N/A

Type of equipment maintained

Minicomputers: IBM S3X, Digital MicroVax

Business PCs: IBM and compatibles

Peripherals: IBM and compatibles

Note: Company is owned by Getronics and commenced operations in May 1989.

The first part of the paper discusses the importance of understanding the cultural context of the research. It highlights the need for researchers to be sensitive to the values and beliefs of the communities they are studying. This is particularly important in the field of education, where cultural differences can significantly impact learning outcomes. The paper then moves on to discuss the challenges of conducting research in diverse cultural settings. It notes that researchers often face difficulties in establishing rapport with participants and in interpreting their responses. To address these challenges, the paper suggests several strategies, including the use of local researchers and the development of culturally appropriate research instruments. The final part of the paper discusses the importance of ethical considerations in cross-cultural research. It emphasizes the need for researchers to obtain informed consent from participants and to ensure that their research does not cause harm or exploitation. The paper concludes by noting that while cross-cultural research is a complex and challenging endeavor, it is also a highly rewarding one that can lead to a deeper understanding of human behavior and culture.

COMPANY PROFILE

GRANADA COMPUTER SERVICES SA

Spain

Plaza Pablo Ruiz Picasso

30 Planta

28020 Madrid Torre Picasso

Country Code (34) Area Code (1)

Number: 597 2164

Company Information	Number of service centres:	12
	Number of employees in maintenance:	89
	Number of engineers:	68
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel	4
Revenues derived from maintenance		
	- 1989 Revenues:	Pta 965 million
	- 1990 Forecast:	N/A
Total revenues		
	- 1989 Revenues:	N/A
	- 1990 Revenues:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers



COMPANY PROFILE

SINTEC

Spain
Parque Tecnologico de Madrid
Torres Quevedo
28760 Tres Cantos
Madrid
Country Code (34) Area Code (1)
Number: 803 1819

Company Information	Number of service centres:	30
	Number of employees in maintenance:	150
	Number of engineers:	110
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel:	4

Revenues derived from maintenance

- 1989 Revenues:	Pta 1,200 million
- 1990 Forecast:	Pta 1,500 million
Total revenues	
- 1989 Revenues:	Pta 1,200 million
- 1990 Revenues:	Pta 1,500 million

Type of equipment maintained

Minicomputers:	Philips, Nixdorf, Olivetti
Business PCs:	IBM PC-XT, AT
Peripherals:	IBM

- Note: - Nixdorf now owns 51% of Sintec.
- Company concentrates on the banking and financial sector.







Profiles of Swedish Independent Vendors





COMPANY PROFILE

GRANADA COMPUTER SERVICES AB

Sweden

Upplagsvagen 1-3

S-11743 Stockholm

Country Code (46) Area Code (8)

Number: 726 1990

Company Information

Number of service centres:	3
Number of employees in maintenance:	24
Number of engineers:	17
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	2

Revenues derived from maintenance

- 1989 Revenues:	SK 20 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers

N/A = Not available



COMPANY PROFILE

TELUB SERVICE AB

Sweden

Box 278

35105 Växjö

Country Code (46) Area Code (470)

Number: 717000

Company Information	Number of service centres:	18
	Number of employees:	180
	Number of engineers:	130
	- Field engineers:	100
	- Bench engineers:	30
	Number of sales personnel	20

Revenues derived from maintenance

- 1989 Revenues:	SK 100 million
- 1990 Forecast:	SK 120 million
Total revenues	
- 1989 Revenues:	SK 117 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Digital, IBM, Data General, CMC, MBF
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers





Profiles of United Kingdom Independent Vendors





COMPANY PROFILE

ACT

United Kingdom
1 Demuth Way
Oldbury
West Midlands B69 4LT
Country Code (44) Area Code (21)
Number: 541 1234

Company Information

Number of service centres:	18
Number of employees in maintenance:	717
Number of engineers:	400
- Field engineers:	275
- Bench engineers:	125
Number of sales personnel:	20

Revenues derived from maintenance

- 1989 Revenues:	£8.0 million
- 1990 Forecast:	£14.0 million
Total revenues	
- 1989 Revenues:	£2.8 million
- 1990 Forecast:	£37.0 million

Type of equipment maintained

Minicomputers:	DEC, Sequent, Motorola, Sequoia, Momentum
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	EPOS and retail systems

Note: ACT is part of Apricot Computer. In April 1989 ACT acquired DDT and in November 1989, as a consequence of the acquisition of ITL, the maintenance business of ITL merged with ACT.

N/A = Not available



COMPANY PROFILE

ADVANCED TECHNOLOGY MAINTENANCE LTD.

United Kingdom
21 Bristol Road
Metropolitan Centre
Greenford
Middx UB6 8UP
Country Code (44) Area Code (81)
Number: 578 9222

Company Information	Number of service centres:	10
	Number of employees in maintenance:	150
	Number of engineers:	75
	- Field engineers:	59
	- Bench engineers:	16
	Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£4.4 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	*£7.0 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Digital PDP, MicroVAX II
Business PCs:	IBM, Compaq, Amstrad, Toshiba and all major manufacturers
Peripherals:	Dataproducts, DEC, Ricoh, Canon, HP, all major manufacturers
Other Equipment:	Networks—Novell, 3Com

* Includes fourth-party maintenance revenues.



COMPANY PROFILE

COMPUTER REPAIR CENTRES LTD.

United Kingdom

17 Thame Park Road

Thame

Oxon OX9 3XD

Country Code (44) Area Code (844)

Number: 261900

Company Information	Number of service centres:	6
	Number of employees in maintenance:	105
	Number of engineers:	57
	- Field engineers:	32
	- Bench engineers:	25
	Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£2.1 million
- 1990 Forecast:	£2.5 million
Total revenues	
- 1989 Revenues:	£3.7 million
- 1990 Forecast:	£4.4 million

Type of equipment maintained

Peripherals: Maxtor, Quantum, Rodime, Archive, NEC

Other Equipment: Motorola, Epoch, Perq, Opus

Notes: Company provides field and workshop repair facilities for manufacturers, OEMs and end users.



COMPANY PROFILE

CREST PERIPHERAL SERVICES

United Kingdom

Webbs Court

8 Holmes Court

Early

Reading RG6 2BH

Country Code (44) Area Code (734)

Number: 660124

Company Information

Number of service centres:	1
Number of employees in maintenance:	12
Number of engineers:	8
- Field engineers:	2
- Bench engineers:	6
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£400 thousand
- 1990 Forecast:	£500 thousand
Total revenues	
- 1989 Revenues:	£400 thousand
- 1990 Forecast:	£500 thousand

Type of equipment maintained

Peripherals: Tape-based peripherals—Pertec, Cipher, Kennedy,
Pertec disks

Note: Partial independent maintenance/FPM company



COMPANY PROFILE

DATA LOGIC

United Kingdom
Queens House East
Greenhill Way
Harrow
Middx HA1 1YR
Country Code (44) Area Code (081)
Number: 863 0383

Company Information

Number of service centres:	7
Number of employees in maintenance:	210
Number of engineers:	130
- Field engineers:	105
- Bench engineers:	25
Number of sales personnel:	7

Revenues derived from maintenance

- 1989 Revenues:	£7.5 million
- 1990 Forecast:	£8.3 million
Total revenues	
- 1989 Revenues:	£45.0 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM S34, S36, S38, Digital PDP
Business PCs:	IBM 6150, IBM, all other major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	Communications equipment, modems, MUXs, etc.



COMPANY PROFILE

DCM SERVICES LTD.

United Kingdom
Shire Park
Welwyn Garden City
Hertfordshire AL7 1LB
Country Code (44) Area Code (707)
Number: 372166

Company Information

Number of service centres:	7
Number of employees in maintenance:	130
Number of engineers:	100
- Field engineers:	85
- Bench engineers:	15
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£2.5 million
- 1990 Forecast:	£4.5 million
Total revenues	
- 1989 Revenues:	£6.0 million
- 1990 Forecast:	£8.5 million

Type of equipment maintained

Business PCs: IBM and compatibles

Peripherals: Networks—Novell, token ring

Note: Formerly Dataserve Ltd.



COMPANY PROFILE

DIGITAL COMPUTER SERVICES LTD.

United Kingdom
Network House
Oxford Road
Denham, Uxbridge
Middx UB9 4DN
Country Code (44) Area Code (895)
Number: 74141

Company Information

Number of service centres:	5
Number of employees in maintenance:	111
Number of engineers:	86
- Field engineers:	71
- Bench engineers:	15
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£6.0 million
- 1990 Forecast:	£7.0 million
Total revenues	
- 1989 Revenues:	£6.0 million
- 1990 Forecast:	£7.0 million

Type of equipment maintained

Mainframes:	Digital VAX 8000 Series
Minicomputers:	Digital PDP—U-Bus & Q-Bus, IBM S34, S36, Wang VS
Business PCs:	Digital, IBM, Apple, Wang, Compaq, NEC, Tandon, Wyse, Olivetti, Zenith, Apricot, Future
Peripherals:	Epson, Mannesmann, Printronix, HP Laserjet, Digital, Dataproducts, Dataprinter, Pericom, Wyse
Other Equipment:	Communications—Bridge, Racal, Miracle, Dowty, CASE



COMPANY PROFILE

EXTEL INFORMATION TECHNOLOGY

United Kingdom
298 Regents Park Road
Finchley
London N3 2LZ
Country Code (44) Area Code (81)
Number: 346 0200

Company Information	Number of service centres:	12
	Number of employees in maintenance:	250
	Number of engineers:	150
	- Field engineers:	130
	- Bench engineers:	20
	Number of sales personnel:	20

Revenues derived from maintenance

- 1989 Revenues:	£14 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	ICL 2900, 2903, 2904, ME 29
Minicomputers:	IBM S34, S36, S38, AS/400, DMS Hinet, ICL DRS 20, DRS 300
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	Communications—EQPT X.25, Multiplexers, modems, LAN, WAN

Note: In May 1990, MBS announced it was acquiring Extel.



COMPANY PROFILE

FERRARI HOLDINGS PLC **(Ferrari Technical Services)**

United Kingdom

Ferrari House

Church Road

Egham Surrey TW20 9LB

Country Code (44) Area Code (784)

Number: 421511

Company Information	Number of service centres:	2
	Number of employees in maintenance:	230
	Number of engineers:	150
	- Field engineers:	120
	- Bench engineers:	30
	Number of sales personnel:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	£11 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	£60 million
	- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	Most major manufacturers
Business PCs:	Most major manufacturers
Peripherals:	Printers, laser printers
Other Equipment:	Network—Novell, token ring



COMPANY PROFILE

GRANADA COMPUTER SERVICES INTERNATIONAL LTD.

United Kingdom
European Headquarters
27 Broad Street
Wokingham
Berks RG11 1AU
Country Code (44) Area Code (734)
Number: 774000

Company Information

Number of service centres:	107
Number of employees in maintenance:	2,797
Number of engineers:	1,958
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	117

Revenues derived from maintenance

- 1989 Revenues:	\$260 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	\$320 million
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers; in total about 750 different brands
Minicomputers:	All major manufacturers; in total about 750 different brands
Business PCs:	All major manufacturers; in total about 750 different brands
Peripherals:	All major manufacturers; in total about 750 different brands
Other Equipment:	Networks

* Total European data



COMPANY PROFILE

GRANADA COMPUTER SERVICES (U.K.) LTD.

United Kingdom
Excell House
Wilbury Way
Trust Industrial Estate
Hitchin, Herts SG4 0VZ
Country Code (44) Area Code (462)
Number: 421511

Company Information	Number of service centres:	35
	Number of employees in maintenance:	1,948
	Number of engineers:	1,416
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Number of sales personnel:	55
	Revenues derived from maintenance	
	- 1989 Revenues:	£110 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A
	Type of equipment maintained	
	Mainframes:	All major manufacturers
	Minicomputers:	All major manufacturers
	Business PCs:	All major manufacturers
	Peripherals:	All major manufacturers
	Other Equipment:	Networks



COMPANY PROFILE

ICM

United Kingdom

ICM House

Oakwell Way

Birstal

West Yorks WF7 9LU

Country Code (44) Area Code (924)

Number: 477 874

Company Information

Number of service centres:	11
Number of employees in maintenance:	105
Number of engineers:	89
- Field engineers:	80
- Bench engineers:	3
Number of sales personnel:	9

Revenues derived from maintenance

- 1989 Revenues:	£4.0 million
- 1990 Forecast:	£6.0 million
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	Digital VAX 8650, VAX 8530
Minicomputers:	Digital VAX 7XX, DEC MicroVAX II to 3800, PDP—U-bus and Q-bus, all VAX and PDP, Altos
Business PCs:	Compaq, Apricot, IBM, Olivetti, Tandon
Peripherals:	Digital, Fujitsu, Mannesmann, Genicom, Data Products, CDC, NEC, Emulex, OKI, Cipher
Other Equipment:	LANs—Ethernet Communications—CASE, Micron-Borer, Racal- Milgo



COMPANY PROFILE

NELSON COMPUTER SERVICES LTD.

United Kingdom
St. Johns Court
Bacup Road
Rawtenstall
Rossendale
Lancs BB4 7PA
Country Code (44) Area Code (706)
Number: 217 755

Company Information

Number of service centres:	4
Number of employees in maintenance:	60
Number of engineers:	24
- Field engineers:	18
- Bench engineers:	6
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1988 Revenues:	£1.1 million
- 1990 Forecast:	£1.7 million
Total revenues	
- 1989 Revenues:	£2.1 million
- 1990 Forecast:	£3.0 million

Type of equipment maintained

Business PCs:	Most leading manufacturers—IBM, Compaq, Tandon, Olivetti, Amstrad, Apple, Acer, Epson, Tulip, Opus
Peripherals:	Most leading manufacturers
Other Equipment:	Networks, CAD/CAM, punched card—IBM, ICL, Univac, Kode, Decision Data Forms Handling—burstors, decollators, guillotines



COMPANY PROFILE

Q-COM MAINTENANCE

United Kingdom
Monaco House
Bristol Street
Birmingham B5 7AS
Country Code (44) Area Code (21)
Number: 622 7165

Company Information	Number of service centres:	3
	Number of employees in maintenance:	25
	Number of engineers:	18
	- Field engineers:	14
	- Bench engineers:	4
	Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£350 thousand
- 1990 Forecast:	£500 thousand
Total revenues	
- 1989 Revenues:	£350 thousand
- 1990 Forecast:	£500 thousand

Type of equipment maintained

Business PCs:	Most major manufacturers, including IBM, Compaq, Tandon, Schneider, Apricot, Opus
Peripherals:	Most major manufacturers, including Epson, Brother, Anadex, Star
Other Equipment:	Cambridge Colour Graphics



COMPANY PROFILE

SERVICETEC LTD.

United Kingdom
 Boulton Road
 Pin Green
 Stevenage
 Herts SG1 4QV
 Country Code (44) Area Code (438)
 Number: 722 922

Company Information	Number of service centres:	11
	Number of employees in maintenance:	252
	Number of engineers:	180
	- Field engineers:	120
	- Bench engineers:	60
	Number of sales personnel:	10
	Revenues derived from maintenance	
	- 1989 Revenues:	£13 million
	- 1990 Forecast:	£15 million
	Total revenues	
	- 1989 Revenues:	£13 million
	- 1990 Forecast:	£15 million

Type of equipment maintained

Minicomputers:	IBM S36, Series 1, Ferranti, Argus
Business PCs:	IBM, Compaq, Olivetti, Ferranti, Apple, and other compatibles
Peripherals:	IBM, HP, Kyocera, Qume, Epson, Canon, Brother, Facit
Other Equipment:	Modems, 3270 controllers, and terminals

Note: In 1989 Servicetec acquired the computer maintenance operations of Ferranti Computers.



COMPANY PROFILE

SIMMONS MAGEE COMPUTERS

United Kingdom
13 York Street
Twickenham TW1 3J2
Country Code (44) Area Code (81)
Number: 891 477

Company Information

Number of service centres:	3
Number of employees in maintenance:	30
Number of engineers:	24
- Field engineers:	22
- Bench engineers:	N/A
Number of sales personnel:	2

Revenues derived from maintenance

- 1989 Revenues:	£850 thousand
- 1990 Forecast:	£2.5 million
Total revenues	
- 1989 Revenues:	£17.0 million
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	S36, MicroVax, Compaq Systempro
Business PCs:	Compaq, Amstrad, Tulip, Toshiba, Epson, IBM and compatibles
Peripherals:	HP, Epson, OKI, NEC, Dataproducts
Other Equipment:	Networks

Note: Primarily a dealer organisation. Total number of engineers includes system support staff.



COMPANY PROFILE

SORBUS U.K. LTD.

United Kingdom

13 Mount Road

Feltham

Middx TW13 6AR

Country Code (44) Area Code (81)

Number: 898 9631

Company Information

Number of service centres:	7
Number of employees in maintenance:	300
Number of engineers:	200
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	N/A

Revenues derived from maintenance

- 1989 Revenues:	£13.5 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Wide range of equipment, from PC to mainframe



COMPANY PROFILE

SYSTEMS RELIABILITY PLC

United Kingdom
400 Dallow Road
Luton
Beds LU1 1R
Country Code (44) Area Code (582)
Number: 408502

Company Information	Number of service centres:	13
	Number of employees in maintenance:	180
	Number of engineers:	140
	- Field engineers:	120
	- Bench engineers:	20
	Number of sales personnel:	8

Revenues derived from maintenance

- 1989 Revenues:	£8.0 million
- 1990 Forecast:	£9.5 million
Total revenues	
- 1989 Revenues:	£25.0 million
- 1990 Forecast:	£30.0 million

Type of equipment maintained

Mainframes:	IBM
Minicomputers:	Altos, Alpha Micro, IMP, Roco
Business PCs:	IBM, Compaq and all leading compatibles
Peripherals:	Most printers, VDUs, plotters



COMPANY PROFILE

THORN EMI COMPUTERAID

United Kingdom
40 Invincible Road
Farnborough
Hants GU14 7UQ
Country Code (44) Area Code (252)
Number: 548888

Company Information

Number of service centres:	12
Number of employees in maintenance:	400
Number of engineers:	275
- Field engineers:	220
- Bench engineers:	40
Number of sales personnel:	15

Revenues derived from maintenance

- 1989 Revenues:	£14 million
- 1990 Forecast:	£19 million
Total revenues	
- 1989 Revenues:	£18 million
- 1990 Forecast:	£25 million

Type of equipment maintained

Business PCs:	IBM, Compaq, Apple, Toshiba, Dell, Future and compatibles
Peripherals:	Laser printers, matrix printers
Other Equipment:	EPOS terminals Networks—token ring, Ethernet

Note: Total number of engineers includes system support staff.



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Profiles of Other European Independent Vendors





COMPANY PROFILE

SORBUS Ges. mBH

Austria

Millergasse 13

A-1060 Vienna

Country Code (43) Area Code (222)

Number: 596 1505

Company Information

Number of service centres:

Number of employees in maintenance:

Number of engineers:

- Field engineers:

- Bench engineers:

Number of sales personnel:

Revenues derived from maintenance

- 1989 Revenues: AS 27 million

- 1990 Forecast: N/A

Total revenues

- 1989 Revenues: N/A

- 1990 Forecast: N/A

Type of equipment maintained

Mainframes:

Minicomputers:

Business PCs:

Peripherals:

Other Equipment:

Note: Sorbus' operation in Austria is a subdivision of its operation in West Germany.

N/A = Not available



COMPANY PROFILE

TELUB SERVICE A/S

Denmark

Naverland 29

DK-2600 Glostrup

Country Code (45) Area Code (42)

Number: 458844

Company Information	Number of service centres:	3
	Number of employees in maintenance:	35
	Number of engineers:	25
	- Field engineers:	25
	- Bench engineers:	N/A
	Number of sales personnel:	3

Revenues derived from maintenance

- 1989 Revenues:	DK 18 million
- 1990 Forecast:	DK 20 million

Total revenues

- 1989 Revenues:	DK 18 million
- 1990 Forecast:	DK 20 million

Type of equipment maintained

Mainframes:

Minicomputers:

Business PCs:

Peripherals:

Other Equipment:



COMPANY PROFILE

TELUB SERVICE OY

Finland

Kornfallsvagen 2A

SF-6800 Helsingfors

Country Code (358) Area Code (7)

Number: 22733

Company Information

Number of service centres:	7
Number of employees in maintenance:	30
Number of engineers:	26
- Field engineers:	26
- Bench engineers:	N/A
Number of sales personnel:	2

Revenues derived from maintenance

- 1989 Revenues:	FM 14 million
- 1990 Forecast:	FM 15 million
Total revenues	
- 1989 Revenues:	FM 14 million
- 1990 Forecast:	FM 15 million

Type of equipment maintained

Mainframes:

Minicomputers:

Business PCs:

Peripherals:

Other Equipment:



COMPANY PROFILE

COMPUTER MAINTENANCE IRELAND

Ireland

Bracken House

Bracken Road

Sandyford Industrial Estate

Dublin 18

Country Code (353) Area Code (1)

Number: 955777

Company Information

	Republic	Northern Ireland
Number of service centres:	4	1
Number of employees in maintenance:	35	33
Number of engineers:	31	29
- Field engineers:	27	25
- Bench engineers:	4	4
Number of sales personnel:	N/A	N/A
Revenues derived from maintenance		
- 1989 Revenues:	£IRL 1.9 million	£ 1.9 million
- 1990 Forecast:	£IRL 2.1 million	£ 2.3 million
Total revenues		
- 1989 Revenues:	N/A	N/A
- 1990 Forecast:	N/A	N/A

Type of equipment maintained

Minicomputers: IBM System 3X, AS/400

Business PCs: IBM and compatibles

Peripherals: Fujitsu, CDC, Dataproducts, Genicom

Notes: Computer Maintenance Ireland is an Irish-registered company with similar-size operations in the Republic and Northern Ireland.



COMPANY PROFILE

DDT

Ireland

VMT 1&3

Leopardstown Office Park

Foxrock

Dublin 16

Country Code (353) Area Code (1)

Number: 954888

Company Information

	Republic	Northern Ireland
Number of service centres:	3	1
Number of employees in maintenance:	28	7
Number of engineers:	19	6
- Field engineers:	16	4
- Bench engineers:	3	2
Number of sales personnel:	N/A	N/A
Revenues derived from maintenance		
- 1989 Revenues:	£IRL 1.0 million	£ 0.5 million
- 1990 Forecast:	N/A	N/A
Total revenues		
- 1989 Revenues:	£IRL 1.0 million	£ 0.5 million
- 1990 Forecast:	N/A	N/A

Type of equipment maintained

Business PCs: IBM and compatibles, all major manufacturers

Notes: DDT is part of ACT U.K. (Apricot). The sole business is computer maintenance. DDT is an Irish-registered company with operations in the Republic of Ireland and Northern Ireland.



COMPANY PROFILE

MEMOREX TELEX IRELAND LTD.

Ireland

Merrion House

Merrion Road

Dublin 4

Country Code (353) Area Code (1)

Number: 839222

Company Information	Number of service centres:	N/A
	Number of employees in maintenance:	40
	Number of engineers:	34
	- Field engineers:	30
	- Bench engineers:	4
	Number of sales perssonel:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	*£IRL 2.0 million
	- 1990 Forecast:	N/A
	Total revenues	
	- 1989 Revenues:	£IRL 9.0 million
	- 1990 Forecast:	N/A

Type of equipment maintained

IBM and PWG compatible range PC to 3090

Memorex Telex products

Notes: * Denotes independent maintenance revenue. Total maintenance revenue £IRL 4.5 million. Company was renamed Memorex Telex in 1990, was previously Specialist Machine Services (SMS), and was acquired by Memorex in 1987.



COMPANY PROFILE

TELUB SERVICE A/S

Norway

Loren Vangen 23

Postboks 48 Refstad

N-0513 Oslo 5

B 9360 Buggenhout

Country Code (47) Area Code (2)

Number: 652250

Company Information

Number of service centres:	5
Number of employees in maintenance:	30
Number of engineers:	26
- Field engineers:	26
- Bench engineers:	N/A
Number of sales personnel:	2

Revenues derived from maintenance

- 1989 Revenues:	NK 21 million
- 1990 Forecast:	NK 29 million
Total revenues	
- 1989 Revenues:	NK 24 million
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:

Minicomputers:

Business PCs:

Peripherals:

Other Equipment:



COMPANY PROFILE

GRANADA COMPUTER SERVICES AG

Switzerland

Ried Strasse 8

CH-8953 Dietikon

Country Code (41) Area Code (1)

Number: 740 2415

Company Information

Number of service centres:	2
Number of employees in maintenance:	13
Number of engineers:	8
- Field engineers:	N/A
- Bench engineers:	N/A
Number of sales personnel:	1

Revenues derived from maintenance

- 1989 Revenues:	SF 1.6 million
- 1990 Forecast:	N/A
Total revenues	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	All major manufacturers
Minicomputers:	All major manufacturers
Business PCs:	All major manufacturers
Peripherals:	All major manufacturers
Other Equipment:	All major manufacturers



COMPANY PROFILE

SORBUS AG

Switzerland

Boesch 41

CH-6331 Hünenberg

Country Code (41) Area Code (42)

Number: 382 288

Company Information

Number of service centres:

Number of employees in maintenance:

Number of engineers:

- Field engineers:

- Bench engineers:

Number of sales personnel:

Revenues derived from maintenance

- 1989 Revenues: SF 1.5 million

- 1990 Forecast: N/A

Total revenues

- 1989 Revenues: N/A

- 1990 Forecast: N/A

Type of equipment maintained

Mainframes:

Minicomputers:

Business PCs:

Peripherals:

Other Equipment:







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Profiles of United States Independent Vendors



COMPANY PROFILE

AMSCO

(formerly TRW Medical Electronics)
United States
3555 Woodhead Drive
Northbrook, IL 60062
(708) 564-5510

Company Information

Number of service centers:	11
Number of employees in maintenance:	300
Number of engineers:	208
- Field engineers:	190
- Bench engineers:	18

Revenues derived from maintenance

- 1989 Revenues:	\$ 300M
- 1990 Forecast:	\$ 350M

Type of equipment maintained

Business PCs:	various manufacturers
Peripherals:	various manufacturers



COMPANY PROFILE

BANTEC SERVICE CORP.

United States
4435 Spring Valley Road
Dallas, TX 95249
(214) 450-7746

Company Information	Number of service centers:	150
	Number of employees in maintenance:	700
	Number of engineers:	660
	- Field engineers:	635
	- Bench engineers:	25
Revenues derived from maintenance		
	- 1989 Revenues:	\$ 258.0M (worldwide)
	- 1990 Forecast:	\$ 290.0M (worldwide)
Type of equipment maintained		
Business PCs:	over 350 manufacturers	



COMPANY PROFILE

**BELL ATLANTIC BUSINESS
SYSTEMS SERVICES**

United States
50 East Swedesford Rd.
Frazer, PA 19355
(215) 296-6000

Company Information	Number of service centers:	200
	Number of employees in maintenance:	3,200
	Number of engineers:	1,700
	- Field engineers:	N/A
	- Bench engineers:	N/A
Revenues derived from maintenance		
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	IBM
Minicomputers:	DEC
Business PCs:	IBM, Compaq
Peripherals:	Epson, Okidata
Other Equipment:	N/A



COMPANY PROFILE

**BELL ATLANTIC COMPUTER
TECHNOLOGY SERVICES
ESS DIVISION**

United States

N92 W14612 Anthony Avenue

Menomonee Falls, WI 53051

(414) 255-4634

Company Information	Number of service centers:	1
	Number of employees in maintenance:	N/A
	Number of engineers:	75
	- Field engineers:	0
	- Bench engineers:	75
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	DEC
Minicomputers:	DEC, Sun
Business PCs:	DEC, IBM
Peripherals:	DEC, Fujitsu disk drives; DEC, Okidata, C.Itoh, Memorex printers; DEC-compatible peripherals



COMPANY PROFILE

**BULL WORLDWIDE
INFORMATION SYSTEMS**

United States
141 Needham St.
Newton, MA 02161
(617) 552-6000

Company Information

Number of service centers:	195
Number of employees in maintenance:	2000
Number of engineers:	N/A
- Field engineers:	N/A
- Bench engineers:	N/A

Revenues derived from maintenance	
- 1989 Revenues:	\$ 45M
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	Bull 8000, 9000
Minicomputers:	Bull DPS 6, 6Plus, 2000
Business PCs:	Apple, Compaq, IBM, Tandon, Zenith
Peripherals:	Amdek, Anadex, Brother, Bull Italia, CII, Citizen, Conrex, Convergent Technologies, Datasouth, Dataproducts, Delphax, Diablo, Digital Equipment, Epson, Genicom, Groupe Bull, HP, Juki, Lasermix, NEC, Okidata, Princeton Graphics, Printronix, QMS, Qume, Star Micronics, Talaris, Telera, Televideo, Wyse, Zebra
Other Equipment:	3Com LANs, Hayes modems



COMPANY PROFILE

C. HOELZLE, ASSOC., INC.

United States
2632 South Croddy Way
Santa Ana, CA 92704
(714) 850-9191

Company Information

Number of service centers:	1
Number of employees in maintenance:	17
Number of engineers:	12
- Field engineers:	0
- Bench engineers:	12

Revenues derived from maintenance

- 1989 Revenues:	\$2.8 M
- 1990 Forecast:	\$2.8 M

Type of equipment maintained

Peripherals:	Printronix, Anadex, Data Printer, C.Itoh, Centronics, Mannesmann-Talley
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COMPANY PROFILE

**COMPUTER SERVICE
SUPPLY CORP.**

United States
P.O. Box 673
Londonderry, NH 03053
(800) 255-7815

Company Information

Number of service centers:	10
Number of employees in maintenance:	44
Number of engineers:	36
- Field engineers:	12
- Bench engineers:	24
Revenues derived from maintenance	
- 1989 Revenues:	\$ 5.3M
- 1990 Forecast:	\$ 7.0M

Type of equipment maintained

Mainframes:	IBM, Hitachi
Minicomputers:	IBM, DEC, SUN
Business PCs:	Apple, IBM, Compaq, Seagate, Tandon, Miniscript, Epson, NEC, AT&T, Amtek, Western Digital, HP
Peripherals:	CDC, NEC, Fujitsu, Pertec, Archives



COMPANY PROFILE

COSMIC ENTERPRISES, INC.

United States
84 South Street
Hopkinton, MA 01748
(508) 435-6967

Company Information	Number of service centers:	6
	Number of employees in maintenance:	35
	Number of engineers:	20
	- Field engineers:	10
	- Bench engineers:	10
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A
	Type of equipment maintained	
	Mainframes:	DEC
	Minicomputers:	DEC
	Business PCs:	DEC
	Peripherals:	Pertec, Fujitsu, CDC, Emulex, Televideo



COMPANY PROFILE

DATASERV

United States
12125 Technology Dr.
Eden Prairie, MN 55344
(612) 829-6000

Company Information

Number of service centers:	2
Number of employees in maintenance:	900
Number of engineers:	775
- Field engineers:	700
- Bench engineers:	75

Revenues derived from maintenance	
- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM AS/400
Business PCs:	IBM, Compaq
Peripherals:	IBM, Epson, HP, Okidata
Other Equipment:	IBM and NCR point-of-sale (POS) systems



COMPANY PROFILE

DECISION DATA, INC.

United States
One Progress Avenue
Horsham, PA 19044

Company Information	Number of service centers:	125
	Number of employees in maintenance:	1200
	Number of engineers:	N/A
	- Field engineers:	700
	- Bench engineers:	N/A
Revenues derived from maintenance		
	- 1989 Revenues:	(Total U.S) \$ 145M
	- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM, Wang, Texas Instruments, DEC
Business PCs:	IBM and many others
Peripherals:	All peripherals connected to the above products



COMPANY PROFILE

DICTAPHONE CORPORATION

United States
3191 Broadbridge Ave.
Stratford, CT 06497
(203) 381-7000

Company Information	Number of service centers:	190
	Number of employees in maintenance:	1,000
	Number of engineers:	862
	- Field engineers:	725
	- Bench engineers:	137
	Revenues derived from maintenance	
	- 1989 Revenues:	\$3.2 M
	- 1990 Forecast:	\$5.0 M

Type of equipment maintained

Business PCs:	IBM, various other manufacturers
Peripherals:	Sentinel, Mannesmann-Talley, Storage Technology
Other Equipment:	Communication - Netlink



COMPANY PROFILE

DIEBOLD, INC.

United States
5995 Mayfair Road
North Canton, OH 44720
(216) 497-5024

Company Information

Number of service centers: 400 (U.S., Canada)
Number of employees in maintenance: 2,500
Number of engineers: 2300
- Field engineers: N/A
- Bench engineers: N/A

Revenues derived from maintenance
- 1989 Revenues: \$ 210.0M
- 1990 Forecast: N/A

Type of equipment maintained

Mainframes: IBM
Minicomputers: IBM, BBN, NCR, Tandem
Business PCs: IBM, NEC, Compaq, Genicom, Epson, Datasouth
Peripherals: IBM, Lear Siegler, Wyse, ADDS, and Visual Technologies display stations; Paradyne, Codex, Racal-Milgo, IBM, Hayes, and Rixon modems
Other Equipment: Diebold, NCR, Docutel, and IBM ATMs; IBM, Honeywell, ISC, and NCR teller terminals



COMPANY PROFILE

DOW JONES SERVICE

United States
Route 1 at Ridge Road
South Brunswick, NJ 08857
(609) 520-5766

Company Information	Number of service centers:	77
	Number of employees in maintenance:	N/A
	Number of engineers:	N/A
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Business PCs:	IBM, DEC workstations, Compaq, various others
Peripherals:	IBM, HP, Okidata, Epson, various others
Other Equipment:	Brother, Canon, Emerson, Minolta, NEC, Savin, Relesys; various fax machines, modems, multiplexers, and controllers



COMPANY PROFILE

DYNSERVICE NETWORK

United States
1875 Whipple Road
Hayward, CA 94544
(415) 732-3080

Company Information	Number of service centers:	2
	Number of employees in maintenance:	125
	Number of engineers:	N/A
	- Field engineers:	N/A
	- Bench engineers:	N/A
Revenues derived from maintenance		
	- 1989 Revenues:	\$ 12.0M
	- 1990 Forecast:	\$ 15.0M

Type of equipment maintained

Mainframes:	HDA, IBM, DEC
Minicomputers:	DEC 81, 82
Business PCs:	Compaq, Wyse, IBM, Tandon
Peripherals:	DEC, Diablo, Olivetti



COMPANY PROFILE

EBM SYSTEMS, INC.

United States
7701 Greenbelt Road, Suite 400
Greenbelt, MD 20770
(301) 220-1448

Company Information

Number of service centers:	6
Number of employees in maintenance:	176
Number of engineers:	110
- Field engineers:	91
- Bench engineers:	3

Revenues derived from maintenance

- 1989 Revenues:	\$ 12.9M
- 1990 Forecast:	\$ 13.9M

Type of equipment maintained

Minicomputers:	IBM System 34, 36
Business PCs:	IBM, IBM-compatible, Apple, Wang
Peripherals:	HP, many other vendors' products
Other Equipment:	Communications hardware, software, Novell and Banyan-based systems



COMPANY PROFILE

FRS

(formerly Premier Computer Corporation)
United States
8200 Normandale Blvd.
Suite 424
Bloomington, MN 55437
(612) 835-2586

Company Information	Number of service centers:	1
	Number of employees in maintenance:	217
	Number of engineers:	180
	- Field engineers:	N/A
	- Bench engineers:	180
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Peripherals: CDC, Maxtor, Connor, Micropolis, YE Data,
Alps, Imprimis, Fujitsu, Micro Peripherals,
Seagate, Tandon, Rodime, Miniscribe, Quantum,
NEC, A.Tasi, CMI, IBM, IMI, Olivetti, Priam,
Shugart, Mitsubishi, TEAC, Amdek, AT&T,
Compaq



COMPANY PROFILE

GE COMPUTER SERVICES

United States
5775 Peachtree Dunwoody
Atlanta, GA 30348
(404) 246-6258

Company Information	Number of service centers:	280
	Number of employees in maintenance:	1275
	Number of engineers:	1200
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	DEC, Data General, Point 4
Minicomputers:	DEC, Data General, Point 4
Business PCs:	IBM, AT&T, Tandy, Zenith, Dell, Epson, NEC, Wyse
Peripherals:	HP, DEC, IBM, Texas Instruments



COMPANY PROFILE

GENERAL DISK CORPORATION

United States
1530 Montague Expressway
San Jose, CA 94131
(408) 432-0505

Company Information	Number of service centers:	3
	Number of employees in maintenance:	21
	Number of engineers:	6
	- Field engineers:	3
	- Bench engineers:	3
	Revenues derived from maintenance	
	- 1989 Revenues:	\$ 2.6M
	- 1990 Forecast:	\$ 2.6M

Type of equipment maintained

Peripherals: IBM, Seagate, STC, Memorex, Sperry-Univac,
DEC, Unisys



COMPANY PROFILE

HALIFAX ENGINEERING, INC.

United States
P.O Box 11904
Alexandria, VA 22312
(800) 368-3381

Company Information	Number of service centers:	34
	Number of employees in maintenance:	300
	Number of engineers:	300
	- Field engineers:	N/A
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	\$ 17.0M
	- 1990 Forecast:	\$ 19.5M
	Type of equipment maintained	
	Minicomputers:	DEC, HP, Wang, Zenith
	Business PCs:	various manufacturers
	Peripherals:	various manufacturers



COMPANY PROFILE

IDEA SERVCOM

United States
1515 West 14th Street
Tempe, AZ 85281
(602) 894-7000

Company Information

Number of service centers:	160
Number of employees in maintenance:	650
Number of engineers:	400
- Field engineers:	400
- Bench engineers:	0

Revenues derived from maintenance

- 1989 Revenues:	\$ 70.0M
- 1990 Forecast:	\$ 75.0M

Type of equipment maintained

Mainframes:	IBM, Datapoint, Wang, ISI
Minicomputers:	IBM, Wang, OTC
Business PCs:	Apple, Zenith, Compaq, Idea, Brother, CDC, Corvus, Datasouth, Diablo, Epson
Peripherals:	Hayes, Genicom, ITT, Okidata, Printronics, Televideo, TS, HP, Idea



COMPANY PROFILE

INTEGRATED SYSTEMS GROUP

United States
920 East Broadway
Glendale, CA 91205
(818) 502-1414

Company Information	Number of service centers:	5
	Number of employees in maintenance:	44
	Number of engineers:	N/A
	- Field engineers:	28
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	\$3.7 M
	- 1990 Forecast:	\$3.0 M

Type of equipment maintained

Mainframes:	Convergent/Unisys, General Automation, DEC, Data General, Alpha Micro
Peripherals:	various manufacturers
Other Equipment:	IBM, Banyan, Novell



COMPANY PROFILE

INTELOGIC TRACE, INC.

United States
8415 Datapoint
San Antonio, TX 78229
(312) 512-558-5465

Company Information	Number of service centers:	over 200
	Number of employees in maintenance:	1,465
	Number of engineers:	N/A
	- Field engineers:	617
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	\$ 130M
	- 1990 Forecast:	N/A

Type of equipment maintained

Minicomputers:	IBM Systems 34, 36, 38, Wang OIS, VS, 2200
Business PCs:	IBM, Compaq, Samsung, Wyse, AST, Grid, Toshiba
Peripherals:	CDC, Canon, Epson
Other Equipment:	over 7,000 other products, manufactured by 400 vendors



COMPANY PROFILE

KETTERMAN, INC.

United States
11106 Morrison Lane
Dallas, TX 75229
(214) 241-4766

Company Information

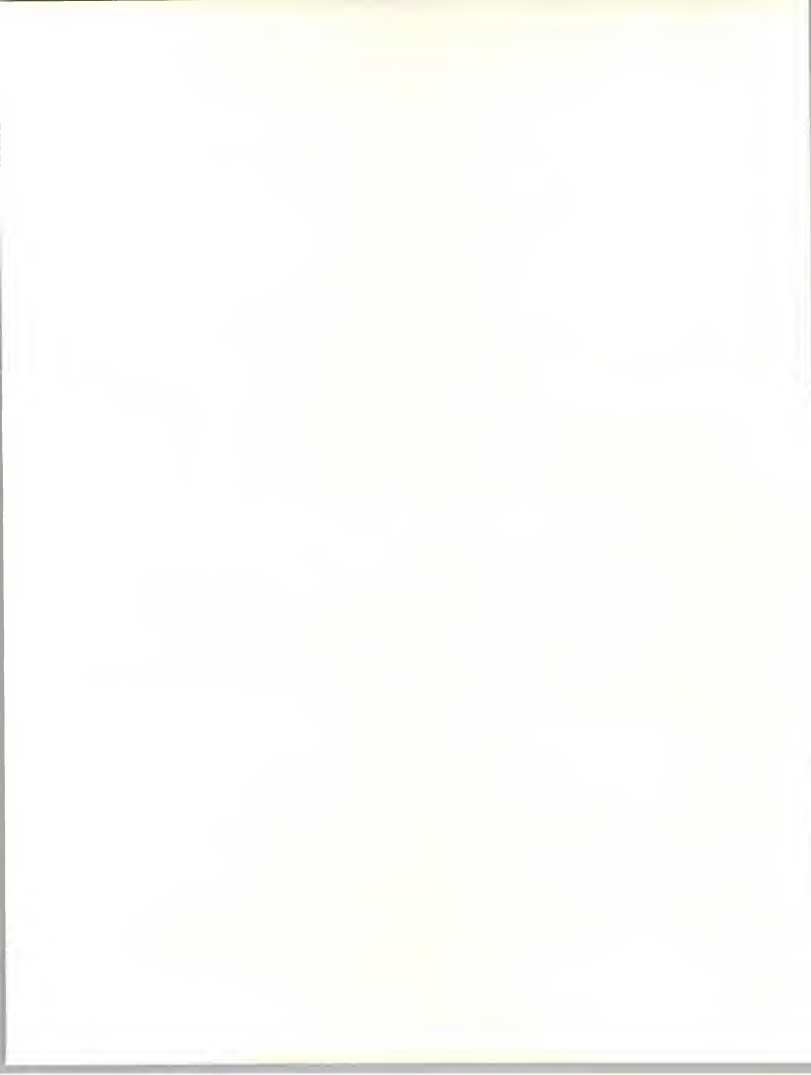
Number of service centers:	30
Number of employees in maintenance:	105
Number of engineers:	100
- Field engineers:	70
- Bench engineers:	30

Revenues derived from maintenance

- 1989 Revenues:	N/A
- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	Unisys
Minicomputers:	IBM, ISC, Acer, IT, Okidata, Lundy, Datamax, Brother, Datasouth
Business PCs:	IBM, ISC, Acer, IT, Okidata, Lundy, Datamax, Brother, Datasouth
Peripherals:	Datamax, Televideo



COMPANY PROFILE

**MCDONNELL DOUGLAS
FIELD SERVICE COMPANY**

United States
1801 E. St. Andrew Place
Santa Ana, CA 92705
(714) 566-4939

Company Information

Number of service centers:	150
Number of employees in maintenance:	1000
Number of engineers:	750
- Field engineers:	600
- Bench engineers:	150

Revenues derived from maintenance

- 1989 Revenues:	\$ 100M
- 1990 Forecast:	\$ 104M

Type of equipment maintained

Minicomputers:	DEC (except VAX 6000, 9000), Tandem, Data General, McDonnell Douglas Computer Systems
Business PCs:	IBM, AT&T, Compaq
Peripherals:	CDC, Printronix, Dataproducts, HP, DEC, Wyse, Ampex, Dilog
Other Equipment:	British Telephone/Tymnet Network



COMPANY PROFILE

NATIONAL COMPUTER SYSTEMS

United States
1313 Lone Oak Road
Eagan, MN 55121
(612) 683-6000

Company Information	Number of service centers:	130
	Number of employees in maintenance:	650
	Number of engineers:	486
	- Field engineers:	450
	- Bench engineers:	36
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes:	IT
Minicomputers:	IT, Elxsi, Texas Instruments, Data General
Business PCs:	Apple, Sun, Compaq
Peripherals:	Novell, Banyan, 3Com



COMPANY PROFILE

NATIONAL CUSTOMER ENGINEERING

United States
6387 Nancy Ridge Drive
San Diego, CA 92121
(619) 452-7974

Company Information	Number of service centers:	37
	Number of employees in maintenance:	100
	Number of engineers:	100
	- Field engineers:	80
	- Bench engineers:	20
Revenues derived from maintenance		
	- 1989 Revenues:	\$ 5.6M
	- 1990 Forecast:	\$ 8.0M

Type of equipment maintained

Minicomputers:	Honeywell, Altos, General Automation, C.Itoh, McDonnell Douglas, Scan-optic, Sun Microsystems, ADS, IBM
Business PCs:	IBM and various compatibles
Peripherals:	C.Itoh, Dataproducts, various other manufacturers



COMPANY PROFILE

NCR CORPORATION

United States
1334 S. Patterson Blvd.
Dayton, OH 45479
(513) 445-6173

Company Information	Number of service centers:	1,300 (worldwide) 400 (U.S.)
	Number of employees in maintenance:	22,000
	Number of engineers:	N/A
	- Field engineers:	16,000
	- Bench engineers:	N/A
	Revenues derived from maintenance	
	- 1989 Revenues:	\$ 5,956M (worldwide)
	- 1990 Forecast:	N/A

Type of equipment maintained

Mainframes: all NCR-manufactured hardware, over 175 other vendors' products



COMPANY PROFILE

PTXI

United States
2000 Westbridge Drive
Irving, TX 75038
(201) 518-1200

Company Information	Number of service centers:	26
	Number of employees in maintenance:	204
	Number of engineers:	115
	- Field engineers:	103
	- Bench engineers:	12
	Revenues derived from maintenance	
	- 1989 Revenues:	N/A
	- 1990 Forecast:	N/A

Type of equipment maintained

Business PCs: IBM, Compaq, Apple, Zenith, Toshiba, HP, Acer
& others

Peripherals: Almost all accepted brands

COMPANY PROFILE

SHIELDS BUSINESS MACHINES, INC.

United States
410 North 8th Street
Philadelphia, PA 19123
(215) 922-6161

Company Information	Number of service centers:	6
	Number of employees in maintenance:	150
	Number of engineers:	100
	- Field engineers:	90
	- Bench engineers:	10
	Revenues derived from maintenance	
	- 1989 Revenues:	\$ 11.3M
	- 1990 Forecast:	\$ 13.5M

Type of equipment maintained

Business PCs: HP, IBM, Bell, NEC, Epson, Compaq
Peripherals: Diebold



COMPANY PROFILE

SSCI

United States
14762 Bentley
Tustin, CA 92680
(714) 832-7724

Company Information

Number of service centers:	6
Number of employees in maintenance:	11
Number of engineers:	N/A
- Field engineers:	11
- Bench engineers:	N/A

Revenues derived from maintenance

- 1989 Revenues:	\$ 0.5M
- 1990 Forecast:	\$ 0.5M

Type of equipment maintained

Minicomputers: Sperry-Univac V77

Peripherals: various manufacturers, including Pertec, Cipher, ISS, CDC, Dataproducts, Printronics





Vendor Questionnaire

the 1990s, the number of people in the UK who are aged 65 and over has increased from 10.5 million to 12.5 million, and the number of people aged 75 and over from 4.5 million to 6.5 million (Office for National Statistics 2000).

There is a growing awareness of the need to address the needs of older people in the community, and the importance of the role of the general practitioner (GP) in this regard. The Department of Health (1999) has identified the need to improve the health of older people, and the importance of the role of the GP in this regard. The Department of Health (1999) has identified the need to improve the health of older people, and the importance of the role of the GP in this regard.

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Vendor Questionnaire

1990 Independent Maintenance Vendor Questionnaire

I. General

1. Company _____
2. Respondent Name _____
3. Title _____
4. Address _____

5. Country _____
6. Telephone Country Code _____
 Area Code _____
 Number _____

II. Company Profile

7. a. Number of Service Centers _____
 b. Service Centers located in: _____

8. Total Number of Employees _____
9. a. Total Number of Employees _____
 in Independent Maintenance
 b. Total Number of Engineers _____
 c. - Number of Field Engineers _____
 d. - Number of Bench Engineers _____
 e. Number of Sales Staff Selling _____
 Independent Maintenance



10. Equipment Maintained

- a. Mainframes
- b. Minicomputers
- c. PCs
- d. Peripherals
- e. Other

III. Financial Information

1989

1990
(Forecast)

11. a. Total Revenues _____
- b. Total European Revenues _____

12. a. TPM Revenues _____
- b. European TPM Revenues _____

13. Approximately what percentage of your maintenance revenue is derived from:

- a. Mainframe Maintenance _____%
- b. Minicomputer Maintenance _____%
- c. PC Maintenance _____%
- d. Peripheral Equipment Maintenance _____%
- e. Other _____%

14. Approximately what percentage of your maintenance revenue is derived from maintaining the following manufacturers' equipment?

- a. IBM _____%
- b. Digital _____%
- c. Bull _____%
- d. Unisys _____%
- e. ICL _____%
- f. Hewlett-Packard _____%
- g. Wang _____%
- h. Data General _____%
- i. Convergent Technology _____%
- j. Altos _____%
- k. MAI _____%
- l. Olivetti _____%



- m. Apple _____ %
 n. Stratus _____ %
 o. Norsk Data _____ %
 p. Prime _____ %
 q. Sun _____ %
 r. Apollo _____ %
 s. Nokia _____ %
 t. Other _____ %
 Other _____ %

15. Could you please identify the percentage of your maintenance revenues derived from the following industry sectors:

- a. Banking and Finance _____ %
 b. Manufacturing _____ %
 c. Government _____ %
 d. Public Sector _____ %
 e. Retail and Distribution _____ %
 f. Equipment Manufacturers _____ %

IV. Mergers/Acquisitions

16. Has your company been involved in a merger or acquisition in the last twelve months? If so, please give details.

V. Current Service

17. What services does your company currently offer, or plan to offer, other than pure hardware maintenance?

	Current	Future
Planning	<input type="checkbox"/>	<input type="checkbox"/>
Installation	<input type="checkbox"/>	<input type="checkbox"/>
Disaster Recovery	<input type="checkbox"/>	<input type="checkbox"/>
Application Software Support	<input type="checkbox"/>	<input type="checkbox"/>
Consultancy	<input type="checkbox"/>	<input type="checkbox"/>
User Training on Hardware	<input type="checkbox"/>	<input type="checkbox"/>
Preventive Maintenance	<input type="checkbox"/>	<input type="checkbox"/>
System Software Support	<input type="checkbox"/>	<input type="checkbox"/>
Deinstallation	<input type="checkbox"/>	<input type="checkbox"/>
System Configuration	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>



VI. Future Services

18. In which of the following areas, if any, have you diversified, or plan to diversify in the next two or three years:

	Current	Future
a. Hardware Sales	<input type="checkbox"/>	<input type="checkbox"/>
b. Application Software Sales	<input type="checkbox"/>	<input type="checkbox"/>
c. Training	<input type="checkbox"/>	<input type="checkbox"/>
d. Computer Supplies Sales	<input type="checkbox"/>	<input type="checkbox"/>
e. None of the Above	<input type="checkbox"/>	<input type="checkbox"/>
f. Other	<input type="checkbox"/>	<input type="checkbox"/>

VII. User Criteria

19. What, in your opinion, are the reasons users choose TPM?

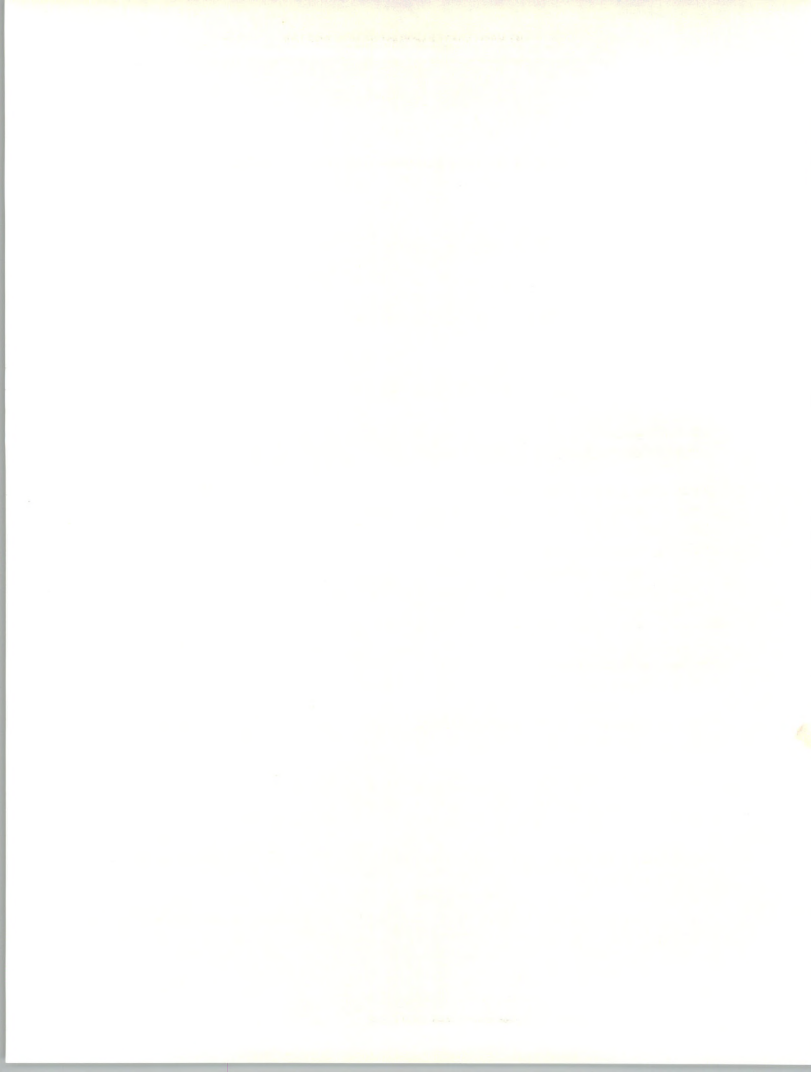
- | | |
|---|--------------------------|
| a. TPM is cheaper | <input type="checkbox"/> |
| b. TPM is more efficient | <input type="checkbox"/> |
| c. TPM offers local service | <input type="checkbox"/> |
| d. TPM offers single-source maintenance | <input type="checkbox"/> |
| e. TPM offers better service | <input type="checkbox"/> |
| f. TPM service is more flexible | <input type="checkbox"/> |
| g. Other _____ | |
| _____ | |
| _____ | |

20. Conversely, what, in your opinion, are the reasons users do not choose TPM service?

- | | |
|---|--------------------------|
| a. Satisfied with manufacturer | <input type="checkbox"/> |
| b. Manufacturer has a service advantage | <input type="checkbox"/> |
| c. TPM is unable to support software | <input type="checkbox"/> |
| d. Users are contractually tied to manufacturer | <input type="checkbox"/> |
| e. User fear of vendor response | <input type="checkbox"/> |
| f. Unaware of TPM | <input type="checkbox"/> |
| g. Other _____ | |
| _____ | |
| _____ | |

VIII. Competition

21. Who do you consider to be your principle competitors in the TPM marketplace?



IX. Independent Maintenance Market Development

I would like to obtain your view on how you believe the independent maintenance market will develop over the next 5 to 10 years.

22. a. Market Growth - Slowing ☐ Current Rate ☐ Increasing ☐
- b. TPM companies will be successful in maintaining software:
 Systems software Agree ☐ Disagree ☐
 Application software Agree ☐ Disagree ☐
- c. Manufacturers' products/diagnostics etc., will progressively eliminate TPM service:
 Agree ☐ Disagree ☐
- d. Independent maintenance will become the province of a small number of large companies, and a large number of very small companies.
 Agree ☐ Disagree ☐
23. What is the primary strategy of your company for, say, the next 5 years?

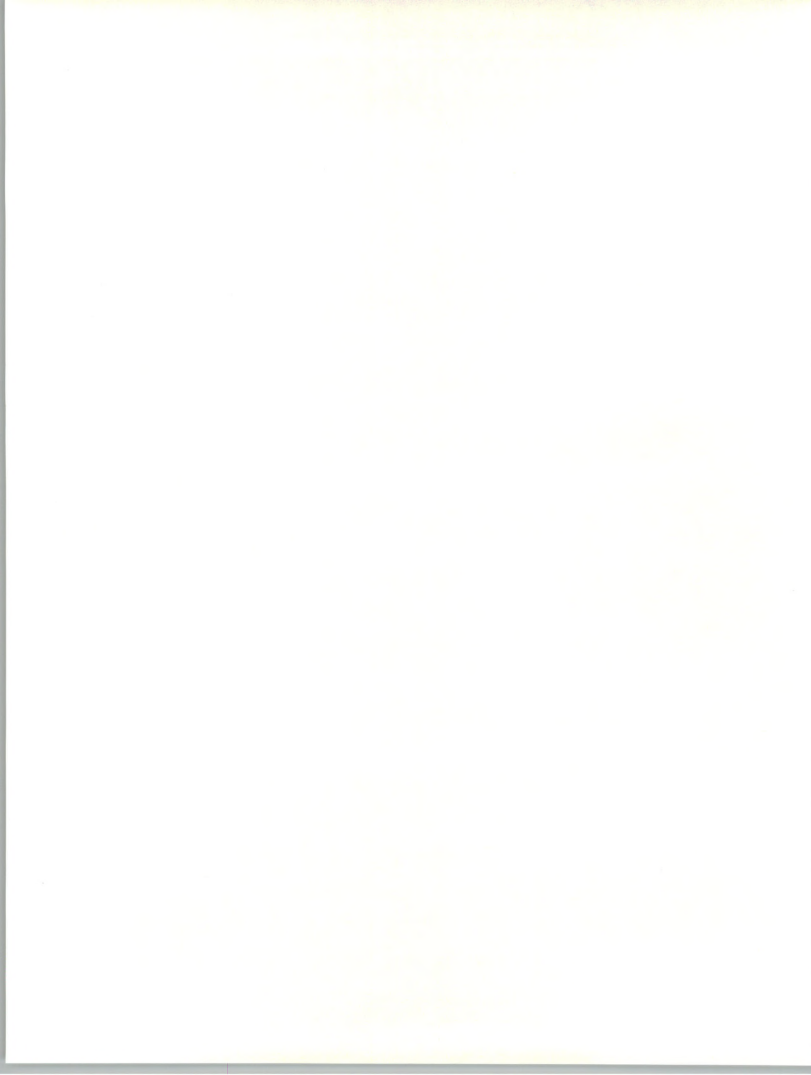
- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Concentrate on independent hardware maintenance | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Diversify into other sectors | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Organic growth | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Growth by acquisition | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Concentrate on specific: | | |
| - Industry sectors | <input type="checkbox"/> | <input type="checkbox"/> |
| - Niche markets | <input type="checkbox"/> | <input type="checkbox"/> |

24. Finally, are there any unique characteristics of the TPM market in your country?

Addition for In-Depth Interview

25. What do you feel are the key issues facing TPM companies?
26. What do you believe TPM companies need to do to ensure their future viability, say over the next 5 years?
27. With the continuing success of TPM, how do you think the manufacturers will react to regain the initiative?







User Questionnaire









User Questionnaire

1990 Independent Maintenance User Questionnaire

A

General

1. What is the make and model number of the main computer on your site and how many do you have?
- Make _____
- Model _____ (CRITICAL INFORMATION)
- Units _____
2. Are you the person who is knowledgeable on the servicing of this system?
(If not, obtain the name of the correct person and start again.)
Name of person responsible _____
3. Do you have another system? What is the make and model number of that system and how many do you have?
- Make _____
- Model _____ (CRITICAL INFORMATION)
- Units _____

All of the following questions that I am going to ask you are related to your _____ system.
(Write in system type.)

(To confirm, read out the make and model number.)

4. So that we can ensure that we get a proper cross-section of industry and commerce, can you tell me what is the main business sector of your company?

(Read out the list to allow for best choice. Then circle appropriate answer.)



Business sector	
- Manufacturing	1
- Distribution	2
- Transportation	3
- Utilities	4
- Banking and Finance	5
- Insurance	6
- Government	7
- Services	8
- Other/Don't Know	9

B**Service Vendor Selection**

I would like to ask you some questions relating to the vendor who services your computer system.

5. Could you please rate the importance of the following criteria in selecting your service vendor, on a scale of 0 to 10 (0 = low, 10 = high).

	Rating
a. Price	_____
b. Quality of service	_____
c. Guaranteed system availability level	_____
d. Guaranteed availability of spare parts	_____
e. Technical expertise	_____
f. Fast response time	_____
g. Availability of software support	_____
h. Ability to provide other services	_____
i. Contract flexibility	_____
j. Ability to service other products	_____
k. Vendor reputation	_____

- 6a. Would you please tell me who services your computer system hardware? (Remind the user _____ system)

(Please check appropriate vendor type; multiple answers are allowed.)

- | | |
|-----------------------------------|--------------------------|
| - Manufacturer | <input type="checkbox"/> |
| - Dealer/distributor | <input type="checkbox"/> |
| - Third-party maintenance company | <input type="checkbox"/> |
| - Own company | <input type="checkbox"/> |
| - Other | <input type="checkbox"/> |

(If the respondent answered YES to third-party maintenance, ask the following question. If not, go to question 8.)



- 6b. I notice that your system, or part of it, is serviced by a third-party maintenance company. Could you tell me the reason you use third-party maintenance?

(Please check appropriate answer; multiple answers allowed.)

- Lower cost ☐
- Local service ☐
- Single-source service ☐
- TPM service higher quality ☐
- More flexible contract ☐
- Don't know/other ☐

- 7a. I notice that you do not use a third-party maintenance company; is there a reason for this?

(Please check appropriate answer; multiple answers allowed.)

- Satisfied with manufacturer ☐
- Manufacturer has an advantage ☐
- TPM cannot support software ☐
- TPM service is higher quality ☐
- Tied to manufacturer with contract ☐
- Fear of system supplier response ☐
- Considered and rejected TPM ☐
- TPM financial weakness ☐
- Unaware of TPM ☐
- Other/Don't know ☐

- 7b. Assuming you were approached by a TPM company, at what level of price reduction would you consider using a TPM vendor to service your computer hardware?

(Please check appropriate answer. Only one answer allowed.)

- 1% - 10% ☐
- 11% - 20% ☐
- 21% - 30% ☐
- 31% - 40% ☐
- 41% - 50% ☐
- 50% + ☐
- Unwilling at any price ☐
- Other/Don't know ☐

8. How important is it that your service vendor communicates with you regularly and effectively to advise you of, for example:

- the status of your system ☐
 - possible problems ☐
 - repair plans ☐
 - availability of spare parts ☐
 - routine visits ☐
 - hardware and software changes ☐
- } INTERVIEWER
} PROMPTS



Could you please provide an importance and satisfaction rating on a scale of 0 to 10, where 0 is of no importance or indicates total dissatisfaction and 10 is at top importance or indicates full satisfaction?

Importance _____

Satisfaction _____

- 9a. Would you prefer all hardware maintenance and software support to be provided by one service vendor at each site? If yes, what would your interest level be?

(Check answer) Yes ☐ No ☐ Don't know ☐

Level of interest: (please check) Low ☐ Medium ☐ High ☐

(If the respondent answered YES, ask:)

- 9b. Who would you prefer that vendor to be?

(Please check appropriate answer; multiple answers allowed.)

- The manufacturer of your main hardware ☐
- Dealer/distributor/VAR ☐
- TPM company ☐
- One of your hardware manufacturers ☐
- Don't know/other ☐

Note: VAR is a Value-Added Reseller.

C

Hardware Maintenance

I would now like to ask you some questions about the hardware maintenance of your computer system. (Reaffirm the system type _____)

Some of the questions are scaled with ratings from 0 to 10. Zero (0) represents zero importance or satisfaction, 5 is average, and 10 represents top importance or full satisfaction.

10. What is your rating for the importance of hardware maintenance to your business and how satisfied are you with your service vendor's performance?

Importance _____

Satisfaction _____

11. If we define SYSTEMS AVAILABILITY as the percentage of your normal working hours that the system is operational (disregarding non-critical peripheral breaks,) what percentage has that been for your system over the last twelve months? _____%



12. How many times each year does your system fail completely for a period of greater than one hour?

per year _____

And what percentage of these system failures are due to:

- | | |
|-------------------------------|---------|
| a. Hardware | _____ % |
| b. Systems software | _____ % |
| c. Applications software | _____ % |
| d. Other (i.e. power failure) | _____ % |

(Please check that percentages add up to 100.)

13. What is your rating for the importance of SYSTEMS AVAILABILITY (scale 0-10), and what is your level of satisfaction?

Importance _____

Satisfaction _____

14. Defining HARDWARE RESPONSE TIME as the time it takes between reporting a fault and the arrival of the service engineer on site (in working hours, that is to say 8 hours = 1 working day), what response time (in hours) do you find acceptable and what did you actually experience as an average over the last twelve months?

- Acceptable _____ Hours

- Experienced _____ Hours

15. If REPAIR TIME is defined as the time taken to get the system fully operational from the time the engineer arrives on site, then what time do you find acceptable (in working hours) and what time did you experience in the last twelve months?

(Note: 8 hours = 1 working day/shift)

- Acceptable _____ Hours

- Experienced _____ Hours

16. I would now like go through a list of five aspects of hardware maintenance and ask you to give both an importance and a satisfaction rating for each (scale 0-10).

	Importance	Satisfaction
Spare availability	_____	_____
Engineer skills	_____	_____
Problem escalation	_____	_____
Documentation	_____	_____
Remote diagnostics	_____	_____

17. How important is it that your system supplier provides a hardware consultancy/planning service to support your operations and how satisfied are you with the service provided? (Scale 0-10).

Importance _____

Satisfaction _____

18. If possible, I would like you to provide some information on hardware maintenance pricing.

- a. What percentage price increase or decrease did you pay for hardware maintenance in the year 1989?

Increase _____%

Decrease _____%

No change 1 (circle)

- b. What do you expect the price changes for hardware maintenance to be in the future, in percentage terms per annum?

Increase _____%

Decrease _____%

No change 1 (circle)

- c. How important do you rate HARDWARE MAINTENANCE PRICING and how satisfied are you with the price you currently pay? (scale 0 - 10)

Importance _____

Satisfaction _____

19. Which type of hardware maintenance contract do you currently have on the main part of your system?

(Please circle appropriate answer; only ONE answer allowed.)

- | | |
|----------------------|--------------------------|
| - Warranty | <input type="checkbox"/> |
| - Three-year | <input type="checkbox"/> |
| - One-year | <input type="checkbox"/> |
| - Time and materials | <input type="checkbox"/> |
| - None | <input type="checkbox"/> |



D**Software Support**

I would like to ask you some questions relating to the service you get from your software support vendor.

These questions relate to SYSTEMS SOFTWARE - NOT APPLICATIONS.

As before, some of the questions are scaled with ratings from 0 to 10. Zero (0) represents zero importance or satisfaction, 5 is average and 10 is top importance or full satisfaction.

20. Who supports your systems software?

(Please check appropriate answer; multiple answers allowed.)

- Hardware manufacturer ☐
- Software house ☐
- Software product vendor ☐
- Value-added reseller (VAR) ☐
- In-house ☐
- Other/Don't know ☐

21. What is your rating for the importance of systems software support to your business and what is your satisfaction with your vendor's systems support activities? (Scale 0-10)

Importance _____

Satisfaction _____

22. What percentage of systems software problems are solved by telephone, and how long does this take in elapsed time from the time it is alerted to the service engineer?

- Solved by phone _____ %

- Elapsed time _____ Hours

23. For those problems NOT possible to solve over the telephone, what RESPONSE TIME would you find acceptable, and what time (on average and in working hours) have you experienced over the last twelve months? (Take RESPONSE TIME to mean from the time the problem is reported to the arrival of the engineer on site.)

- Acceptable _____ Hours

- Experienced _____ Hours

24. If FIX TIME is defined as the time taken to get the system fully operational from the arrival of the engineer on site, then what time (in working hours) do you find acceptable, and what did you experience over the last twelve months?

- Acceptable _____ Hours

- Experienced _____ Hours



25. I would now like to go through a list of five aspects of SYSTEMS SOFTWARE SUPPORT and ask you to give an IMPORTANCE and a SATISFACTION rating for each. (Scale 0 - 10)

	Importance	Satisfaction
Engineer skills	_____	_____
Documentation	_____	_____
Software installation	_____	_____
Provision of updates	_____	_____
Remote diagnostics	_____	_____

26. How important is it that your system supplier provides a systems software consultancy/planning service to support your operations and how satisfied are you with the service provided? (Scale 0 - 10)

Importance _____
Satisfaction _____

27. If possible, I would like you to provide some information on systems software support pricing.

- a. What percentage price increase or decrease did you pay for systems software support in the year 1989?

Increase _____ %
Decrease _____ %
No change 1 (circle)

- b. What do you expect the price changes for systems software support to be in the future, in percentage terms per annum?

Increase _____ %
Decrease _____ %
No change 1 (circle)

- c. How important do you rate SYSTEMS SOFTWARE SUPPORT PRICING and how satisfied are you with the price you currently pay? (Scale 0 - 10)

Importance _____
Satisfaction _____

28. Which type of systems software support contract do you currently have?

(Please check appropriate answer. Only ONE answer allowed.)

- a. Support included in software license fee ☐
b. Three-year contract ☐
c. One-year contract ☐
d. ad hoc ☐
e. none ☐



E

Other Services

29. To conclude this questionnaire, I am particularly interested in obtaining your views on other services or modified current service offerings that your service suppliers could provide that would help to improve the running of your computer systems.

Could you say which of the following services your service vendor is currently contracted to supply and which you would like your service vendor to provide. Also could you give a level of interest rating against each in the range 0 to 10 where 0 = no interest, 5 = average interest and 10 = must have.

(Please circle appropriate answer and give LOI rating.)

	Current		LOI
	Contracted	Require	
Configuration Planning	<input type="checkbox"/>	<input type="checkbox"/>	___
Capacity Planning	<input type="checkbox"/>	<input type="checkbox"/>	___
Environmental Planning	<input type="checkbox"/>	<input type="checkbox"/>	___
Cabling	<input type="checkbox"/>	<input type="checkbox"/>	___
Software Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	___
Consultancy	<input type="checkbox"/>	<input type="checkbox"/>	___
Network Planning	<input type="checkbox"/>	<input type="checkbox"/>	___
Network Management	<input type="checkbox"/>	<input type="checkbox"/>	___
Disaster Recovery	<input type="checkbox"/>	<input type="checkbox"/>	___
Facilities Management	<input type="checkbox"/>	<input type="checkbox"/>	___
Problems Management	<input type="checkbox"/>	<input type="checkbox"/>	___
Applications Software Support	<input type="checkbox"/>	<input type="checkbox"/>	___

These last questions complete the questionnaire. I would like to thank you on behalf of INPUT for helping us to complete this survey. To express our appreciation for your time we will be sending you a "Thank You" pack containing a summary of the results from our survey.

Again, thank you for your time.

Additional Questions for Independent Maintenance User In-Depth Interviews

1. Do you see TPM service as a long-term solution to your service needs?

Yes ☐ No ☐

For how long: 2 3 4 5 10 years
(circle)

The first part of the paper discusses the importance of understanding the underlying mechanisms of the observed phenomena. It is argued that a comprehensive understanding of the system requires a detailed analysis of the various factors that influence its behavior. This involves identifying the key variables and their interactions, as well as the underlying processes that govern the system's dynamics.

In the second part, the authors present a series of experiments designed to test the proposed model. These experiments involve manipulating the input variables and observing the resulting changes in the system's output. The results of these experiments are compared with the predictions of the model, and the degree of agreement is discussed.

The third part of the paper focuses on the implications of the findings for the broader field of research. It is argued that the results of this study have important implications for our understanding of the system and its behavior. These implications are discussed in the context of the existing literature, and the authors provide a summary of the key findings and their significance.

Finally, the paper concludes with a discussion of the limitations of the study and suggestions for future research. It is noted that while the current study provides valuable insights into the system, there are still many questions that remain to be answered. Future research should focus on addressing these questions and further refining the model.

2. Using TPM service, does this create any problems in supporting your systems software?
Yes ☐ No ☐

How is this support achieved?

- The TPM does it ☐
- In-house ☐
- Equipment supplier ☐
- Independent software company ☐

3. Do you believe that TPM companies can provide satisfactory software support?

Systems Software Yes ☐ No ☐
Applications Yes ☐ No ☐

Any comments:

4. Was there a specific reason why you changed to TPM service?

- a. Manufacturer inflexibility ☐
- b. Dissatisfied with manufacturer quality ☐
- c. Need for cost reduction ☐
- d. Single-source service not available from the manufacturer ☐

Any comments:

5. If one of your hardware suppliers approached you with a single-source solution, would you give this serious consideration?
Yes ☐ No ☐

What would your level of interest be on a scale of 0 - 10? (10 is high) _____

6. What do you consider to be the main strengths and weaknesses of TPM companies?

- a. Strengths:

- b. Weaknesses:
-
- 7. What do you consider to be the main strengths or weaknesses of your hardware supplier's service?
 - a. Strengths:

 - b. Weaknesses:

 - 8. Which sort of organisations do you believe will be able to provide independent software support, either now or in the future?

